

THE
NESTS AND EGGS
OF
INDIAN BIRDS,

BY
ALLAN O. HUME, C.B.

SECOND EDITION.

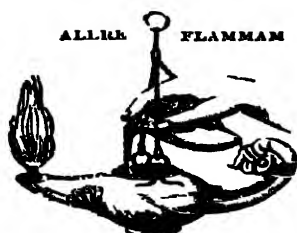
EDITED BY

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THE PASSERES IN 'THE FAUNA OF BRITISH INDIA.'

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EDITOR'S NOTE.

WHEN I undertook to bring out this edition of Mr. Hume's work I fully intended that it should be a supplement, as it were, to my volumes on the Birds of India, with the same arrangement and nomenclature, the whole thus forming a fairly complete history of the Avifauna of the Indian Empire.

My expectations have been disappointed. I find it quite impossible to complete the account of the Birds in the 'Fauna of British India' within the narrow limits of my furlough, and I have been obliged to abandon the work.

This in itself is no matter for regret, as the work will probably be completed by more competent hands than mine; but it is so far regrettable that it will cause a want of agreement or correspondence between the Manual on Birds and Mr. Hume's laborious and ample account of their nidification, a want of correspondence the more to be lamented, inasmuch as no one is likely, I fear, for many years to come, to write a complete history of the Birds of India.

In view therefore of my early return to India and in fulfilment of my promise to Mr. Hume, I have thought it advisable to push the present volume through the press

without a moment's delay. The third and last volume is also in the press, and will be published before I leave England next month. I have had little time to investigate the synonymy of those groups of Indian birds contained in the third, and portion of the second, volume of this work, and which would in the ordinary course of events have appeared in the *Manual on the Birds*; but I have endeavoured to the best of my power to assign to each bird its proper systematic name. It has been, of course, quite impossible to continue the serial numbers of the birds beyond the point to which the *Manual on the Birds* had reached on this second volume going to press.

I again take the opportunity of presenting to Mr. Hume's readers portraits of some of the ornithologists who have made Indian birds their special study. The present volume contains portraits of the late Edward Blyth, of Mr. W. T. Blanford, Colonel H. H. Godwin-Austen, and Major R. G. Wardlaw Ramsay.

EUGENE W. OATES.

London, July 1890.

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ROBERT GEORGE WILSON RAMSAY



HENRY CLAVERSHAM GODWIN-AUSTEN



V O L

EDWARD BLYTH

THE
NESTS AND EGGS
OF
INDIAN BIRDS.

Family MUSCICAPIDÆ.

557. *Muscicapa grisola*, Linn. *The Spotted Flycatcher.*

Butalis grisola, Linn., *Hume*, *Cat.* no. 209 bis.

Dr. Scully informs us that the Spotted Flycatcher breeds in Gilgit in the pine-forests, at elevations over 8000 feet.

Major Wardlaw Ramsay, writing of Afghanistan, says:—"I found the nest on the 3rd June, high up on a hill-side, at about 8000 feet. It was situated in the lowest fork of an edible pine (*Pinus gerardiana*), about six feet from the ground. The nest was composed of shreds of the bark of the juniper-tree, without any lining except a few feathers, and contained four eggs, quite fresh, pale green, profusely freckled with light brown, especially towards the thick end. The position of this nest was rather unusual; but another I found was in a crevice of a ragged juniper-stump."

558. *Hemichelidon sibirica* (Gm.). *The Sooty Flycatcher.*

Hemichelidon fuliginosus, *Hodgs.*, *Jerd. B. Ind.* i, p. 458.

Hemichelidon sibiricus (Gm.), *Hume*, *Rough Draft N. & E.* no. 296.

The late Captain Cock found a nest of the Sooty Flycatcher, on the 5th June, with three eggs at Sonamurg, up the Scind River (Cashmere). It was placed against the side of a tree-trunk.

The eggs are long ovals, a good deal pointed and compressed

towards the lesser end. The ground-colour is a very pale dull green, and it is very faintly mottled, most densely towards the large end, with *very* pale reddish brown. The coloration of the egg is somewhat like that of a very feebly-coloured *Pratincola maura*. The eggs measured 0.65 by 0.46 inch and 0.66 by 0.48.

Mr. Brooks informs us that this Flycatcher is abundant in the pine-woods of Cashmere, about 7000 feet elevation, where it breeds.

Mr. Hodgson figures the nest, placed on the stump end of a broad broken branch—a very massive, rather shallow pad, with a cup-shaped cavity composed of moss and lichens and lined with black moss-roots. The egg is figured as above described. The nest is about 4 inches across and less than 2 high, and the cavity is a little less than 1.75 inch in diameter.

Major Wardlaw Ramsay says, writing of this species in Afghanistan:—"Breeding in May and June."

559. *Hemichelidon ferruginea*, Hodg. *The Ferruginous Flycatcher.*

Alseonax ferrugineus (Hodg.), *Jerd. B. Ind. i*, p. 460.

Hemichelidon ferrugineus, Hodg., *Hume, Rough Draft N. & E.* no. 299.

All I know of the nidification of the Ferruginous Flycatcher is that Mr. Hodgson figures the nest as a beautiful compact circular pad of moss and lichens, 5 inches in diameter and 2 in height, with a small central circular cavity, placed upon the surface of an old stump of a tree. The egg he figures as a sort of buff colour, *café au lait*, minutely and feebly freckled with brownish red, and measuring 0.69 by 0.5 inch.

563. *Siphia hyperythra*, Cabanis. *The Indian Red-breasted Flycatcher.*

Erythrosterna hyperythra (Cab.), *Hume, Rough Draft N. & E.* no. 323 ter.

Mr. Brooks says that the Indian Red-breasted Flycatcher "breeds sparingly in Cashmir at from 6000 to 7000 feet elevation. The males in breeding-plumage have the red of the breast bordered on each side by a stripe of velvet-black. This is not shown in Dr. Bree's illustration. In winter the black border disappears; nor is it regained before the birds leave the plains of India in March and April. The song is sweet, loud and robin-like, but short. I failed to find a nest."

566. *Cyornis hyperythrus* (Bl.). *The Rufous-breasted Blue Flycatcher.*

Siphia superciliaris (Bl.), *Jerd. B. Ind. i*, p. 490.

Digenes superciliaris (Bl.), *Hume, Rough Draft N. & E.* no. 321.

According to Mr. Hodgson's notes the Rufous-breasted Blue

Flycatcher breeds in Nepal and about Darjeeling from April to June. They build on the ground under the roots, or in some cavity at the base, of a tree. The nest is composed of moss and moss-roots, closely lined with the latter; it is a deep cup, with an exterior diameter of 2.75 inches and a height of about 2 inches, with a cavity about 1.5 inch in diameter and depth. Four eggs is the usual number laid, sometimes only three. The eggs are rather elongated ovals, having a pale greyish or brownish-white ground, finely freckled and mottled, chiefly at the large end, with dingy brownish red. As figured, the eggs measure 0.68 by 0.44 inch.

567. *Cyornis leucomelanurus* (Hodgs.). *The Slaty-blue Flycatcher.*

Siphia tricolor (Hodgs.), *Jerd. B. Ind.* i, p. 478

Siphia leucomelanura (Hodgs.), *Jerd. tom. cat.* p. 479.

Digenea leucomelanura, *Hodgs., Hume, Rough Draft N. & E.* no. 320.

The Slaty-blue Flycatcher breeds, we know, throughout the Himalayas from Nipal to Cashmir, at elevations of from 5000 to 7000 feet; but the only persons I know of who have taken the eggs are Captain Cook and Mr. Brooks, who found several nests in Cashmere, and to whom I owe both nests and eggs.

The nests are massive little cups, with an external diameter of from 3½ inches to nearly 4 inches and from 1½ to 2½ inches in height. The egg-cavity is comparatively small, not exceeding 2 inches in diameter and 1½ inch in depth. The principal material of the nest is fine moss, but with this is intermingled a quantity of fine wool and fur, a few cobwebs, and, especially towards the base of the nest, tiny dry leaves, lichen, and fir-needles. There is no separate lining, but the interior of the egg-cavity has the moss and wool very compactly and smoothly woven together, so as to form a beautifully soft and even bed for the eggs. Nests taken in Cashmere on the 3rd and 4th June contained three and four eggs respectively. Mr. Brooks remarks that "this species is not uncommon in Cashmere wherever there are pine-woods. As in the case of *Ianthia rufilata*, many pairs of these birds which were breeding had the male in the plumage of the female! Only two pairs which I shot had blue males.

"The nest is a neat little cup, placed in a hollow in the side of a tree-trunk. The eggs, four in number, are of a pale buff-colour, clouded with dull pale rufous towards the larger end; size .62 by .48 inch."

The eggs of this species vary very much in size and shape. Some are comparatively elongated ovals, some short and broad; all are somewhat compressed, and some are slightly pointed towards the smaller end. The ground-colour is a dull white, but only in a few of the eggs is any portion of this visible, the major portion of the surface even in these, and the whole surface in most eggs, being

excessively finely freckled, and in many cases uniformly tinted, with reddish *café au lait* colour or pale salmon-buff; in many eggs the colour is deeper and redder at the large end, forming an undefined cap. Some of the eggs have a slight gloss, others are absolutely glossless.

These eggs are very similar in tint to those of *Stoparola* and other genera of this family.

In length they vary from 0.58 to 0.69 inch and in breadth from 0.47 to 0.5 inch; but the average of ten eggs is 0.62 inch by a little more than 0.48 inch.

568. *Cyornis superciliaris* (Jerd.). *The White-browed Blue Flycatcher.*

Muscicapula superciliaris (Jerd.), *Jerd. B. Ind. i*, p. 470; *Hume, Rough Draft N & E*, no. 310.

Muscicapula acornaus, *Hodgs, Jerd. tom. cit.* p. 483.

The White-browed Blue Flycatcher, though extending its cold-weather migration far into Southern India, breeds only, so far as I have yet ascertained, in the Himalayas at elevations of from 5000 to nearly 10,000 feet; from Darjeeling to Murree it breeds everywhere, not only in the outer ranges, but far into the interior. I found a nest only a march south of Gungootree; I have received others from the Sutlej Valley above Chini, from Minalee close to the foot of the Rotung, from the Sind Valley, Cashmere, just at the foot of the Zojee La, and I know of one being found at Dras. They lay from the middle of April to the middle of June, building a small cup-shaped nest, about 3 inches in diameter, of moss and moss-roots, and lined with these latter and at times a little fine hair, in holes of trees or even occasionally between two stones of the terraced wall of some fallow or deserted field.

They lay from four to six eggs. The late Captain Beavan correctly remarked that this species was "not at all rare about Simla, in gardens and forest-glades, and not at all shy. I discovered the nest of this species on the 10th of May at that station, with four young ones in it. It is a pretty little cup-shaped structure, composed of moss and hair, placed at the bottom of a small hole in an ilex, at no great depth inside."

Writing from Murree, Colonel C. H. T. Marshall notes having secured "sixteen or eighteen nests between the beginning of May and the end of June, in small holes in rotten branches or trunks of trees, sometimes close to the ground, sometimes very high up. Eggs, five in number, of a yellowish-brown colour, almost round, about .6 inch long and .45 broad. The general elevation averages 6500 feet; they do not build in the lower hills."

Colonel G. F. L. Marshall remarks:—"This Flycatcher is not very common at Naini Tal, and I have only once found the nest; it contained two eggs on the 25th of May. It was a small cup built of moss, lined with horsehair, and wedged into a narrow

vertical rift in a tree about 8 feet from the ground and close to a public road. The nest was deserted after the first day I touched it, and the birds were very shy."

The eggs are generally short broad ovals, slightly pointed towards the small end; a few are very decidedly pointed, and occasionally the whole egg is somewhat elongated; they have a slight gloss.

Looked at from a little distance, the whole egg appears to be a dull pale brownish pink or pinkish brown, somewhat deeper towards the large end, the tint varying in intensity in different specimens. Closely examined, the ground-colour appears to be a dull pale greyish green, almost entirely washed over with a more or less mottled shade of brownish red or pink, which, while it varies in different eggs, is almost without exception considerably deeper about the large end, where in some eggs it forms an utterly undefined, but none the less apparent, cap.

In length the eggs vary from 0.57 to 0.68 inch and in breadth from 0.46 to 0.54; but the average of twenty-seven eggs is 0.62 nearly by rather more than 0.48 inch*.

574. *Cyornis unicolor*, Blyth. *The Pale Blue Flycatcher*.

Cyornis unicolor, *Bl.*, *Jerd. B. Ind.* i, p. 405; *Hume*, *Cat.* no. 303.

Mr. Mandelli sends me a nest of this species taken near Namtchu, in Native Sikhim, on the 1st August. It is a massive cup of moss and fern-roots strongly felted together, about 3.75 inches in diameter and 2 inches in height exteriorly, with a shallow central cavity about 2 inches in diameter and 0.75 inch in depth. It contained two eggs nearly ready to hatch off; it was placed in a depression in the trunk of a huge tree about 10 feet from the ground. Another nest of this species sent me from Sikhim was a felted mass of that peculiar grey stringy lichen that is commonly called "old man's beard." It was little more than a pad 4 inches in diameter and 1 inch in thickness, with a slight hollow in the centre for the egg, and was placed in a hole at the junction of a large branch with the trunk of the tree.

575. *Cyornis rubeculoides* (Vigors). *The Blue-throated Flycatcher*.

Cyornis rubeculoides (*Vig.*), *Jerd. B. Ind.* i, p. 400; *Hume*, *Rough Draft N. & E.* no. 304.

I have never seen the nest of the Blue-throated Flycatcher.

* I omit from this edition the note which appeared in the *Rough Draft* under the head of *Erythrostera pusilla* (no. 324). This name denotes the female of *Cyornis maculata*; but it is doubtful if Hodgson's note really applies to this species.

Mr. Rhodes W. Morgan ('Ibis,' 1875, p. 318) records particulars of the finding of the nest of *Erythrostera maculata* in Southern India. There can be little doubt that he mistook *Hemipus picatus* for this species.—Ed.

Captain Hutton says:—"Arrives in the neighbourhood of Mussoorie in April, and breeds in June, on the 13th of which month I took a nest from a hole in a bank by the roadside in a retired and unfrequented situation. I afterwards found another nest in a hole of a rock, also in a retired spot. The elevation was about 5000 feet; externally this nest is composed of green moss and lined with black fibrous lichens, like hair. The eggs are four in number, of a dull and pale olive-green, faintly or indistinctly clouded with dull rufous or clay-colour."

According to Mr. Hodgson's notes and drawings this species begins to lay in Nepal in April, and the young are ready to fly in June and July; the nest is placed in the hollow of some decayed tree, or in a ledge of rock, more or less overhung. It is composed of grass, dry leaves, moss, and moss-roots, and is lined inside with fine, hair-like blackish moss-roots; it measures about 4 inches in diameter externally and about 1.5 in height; the diameter of the cavity is about 2 inches. It lays three or four eggs, broad ovals, slightly glossy, of a dingy reddish *café au lait* colour, measuring 0.72 by 0.52. It breeds only once a year; both sexes aid in hatching and rearing the young.

A nest of this species found on the 12th of May at Takoldan, in Native Nihlim, contained four fresh eggs. The nest, which is only a little pad of moderately fine roots, in which a couple of skeleton leaves are incorporated at the base, was placed in a hole at the top of a stump of an old tree, only about 3 feet from the ground.

Sometimes they lay in a hole in a bamboo. I had a nest sent me found in such a situation on the 29th April near Darjeeling.

The nest itself was a mere lining to the bottom of the joint of the bamboo, a shallow saucer about 4 inches in diameter, composed of the fine stems of some pennated leaf carefully curved round and one or two dead leaves. The eggs are precisely similar to those sent by Captain Hutton.

Several eggs of this species, which were sent me by Captain Hutton, resemble much, as might have been expected, those of *Cyornis tickelli*; but they seem to average somewhat shorter and broader. In shape they are ovals, some elongated, some rather broad, and all of them a little compressed towards one end. The ground-colour is greenish or brownish stone-colour; some exhibit no markings; others only a little grey freckling, but typically they have a very pale purplish-brown mottled zone near the large end, and occasionally frecklings of the same colour over the whole of the large end of the egg. They have little or no gloss. They vary in length from 0.68 to 0.76 inch and in breadth from 0.56 to 0.66 inch, but the average of the eggs is 0.73 nearly by 0.62 inch.

Some eggs taken by Capt. Cock in Cashmere are similar to those already described, pale greenish stone-coloured ground, freckled all over (but most thickly at the large end) with very pale pinkish brown; but they are very much narrower than the eggs I have

previously obtained, and vary in length from 0·7 to 0·75 and in breadth from 0·51 to 0·57.

The Tenasserim birds are intermediate to the Indian and Sumatran Blue-throated Flycatchers, but nearer, it seems to me, to the latter than the former. Whether with a complete series from all parts of the Malayan peninsula and Burma it will be possible to separate the two appears to me doubtful.

Mr. Davison says:—"On the 30th March at Ye, Tenasserim Provinces, I found a nest of this species. The nest was built in the hole of a rotten stump about 4 feet from the ground, and was composed of dry, rather coarse grass, without any lining whatsoever, resting on a foundation of dry dead leaves. It was so loosely and carelessly put together that it was impossible to preserve the nest. The bird was exceedingly shy, for although I was well hid a short distance off the nest, it was some time before the bird came back to its nest."

The eggs are moderately elongated ovals, somewhat pointed towards one end. The shell is fine and smooth and has a faint gloss. The ground-colour is apparently a creamy white, but the whole egg is thickly freckled and mottled all over with a sort of pale brownish pink and pinkish grey, that very little of the ground is anywhere visible. The freckling is much most dense at the broad end, where it forms a more or less uniform but very ill-defined cap, which I should call a dull pale brownish pink. The three eggs all measure 0·73 in length, and in breadth two measure 0·56 and one 0·55.

576. *Cyornis tickelli*, Blyth. *Tickell's Blue Flycatcher*.

Cyornis banyumas (Horsf.), *Jerd. B. Ind. i*, p. 403.

Cyornis tickelliae, Bl., *Jerd. B. Ind. i*, p. 407: *Hume, Rough Draft N. & E.* no. 306.

Tickell's Blue Flycatcher breeds in May and June throughout Central India and in the Nilghiris and Western Ghats to an elevation of at least 5000 feet.

Mr. Nunn, the first of my correspondents who observed this bird breeding, procured a nest with two fresh eggs at Hoshungabad, Central Provinces, on the 24th of June, 1895. The nest was placed in a niche in a wall on the banks of the Nerbudda. It was a small, rather deep cup, compactly woven of fine grass-roots, and lined with similar materials, but of a still finer quality; externally a few dry leaves were incorporated in the structure, much in the same manner as is habitually done by the Bulbuls and many Sylviine birds. The nest measured internally 2 inches in diameter by 2½ deep.

Mr. Nunn shot the parent bird off the nest and kindly sent it to me with the nest and eggs, so that no doubt as to the authenticity of the eggs can exist. A nest taken by Miss Cookburn below Kotagberry on the 27th May was placed in a hole between two decaying branches of a tree at a height of 6 or 7 feet from the

ground and in the close proximity of water. The nest was composed almost entirely of moss and moss-roots, the latter forming the lining, a good many dead leaves being incorporated in the exterior surface. The nest was between 3 and 4 inches in diameter externally; the egg-cavity very shallow.

Writing about bird-nesting on the Kondabhari Ghât Mr. J. Davidson remarks:—"July 12th. A little Blue Robin darted from its nest. This was placed in a crevice of a bank and might have been mistaken for one of our own familiar Robin Redbreasts. It contained three olive eggs, perfectly fresh. The Blue Robin is one of the commonest birds at this season along the ghâts, and its pretty metallic song seems never to cease if you wander along any of the nullahs. Its nests, of which I found many, including four or five with eggs, were placed in hollows either in banks or in the roots of trees, and were composed of dead leaves lined with fine roots, sometimes intertwined with hair."

Capt. Horace Terry tells us that he found a nest of this bird on the Pulney Hills, in the Pittur Valley, made of fine grass, far down the slopes in a hole in a bank.

Writing of Ceylon Colonel Legge says:—"In the Western Province I have shot the young in nestling-plumage at the end of June and in the Northern Province in the middle of July, so that the breeding-season of this Flycatcher may be said to be May and June throughout the island."

Two eggs of this species, which, with the nest and parent bird, were sent me by Mr. Nunn, are of a moderately elongated oval shape, somewhat obtuse at the small end. The ground-colour is dingy greyish white, and the egg is throughout excessively finely freckled and mottled with dingy reddish brown. The markings are everywhere indistinct and feeble, but they are greatly concentrated and nearly confluent towards the large end, where they form in one a fairly marked zone, in the other an irregular and ill-defined cup. These eggs differ a good deal in their character both from those of *Stoparola* and *Niltava*. Other eggs, taken in May and June, and sent me by Miss Cockburn from Kotagherry, Nilghiris, are very similar to those already described; but in one of them the markings are so closely set that the egg appears throughout a pale brownish rufous, regularly mottled all over, slightly paler.

Another egg is similar, but the general tint is rufescent *café au lait*. As a rule the eggs have a faint gloss, but one or two of them are absolutely glossless.

It must be understood that the markings are usually so excessively fine that, unless closely looked into, the egg appears to be a sort of pale drab with a faint reddish tinge, rather more marked about the large end.

In length the eggs vary from 0.74 to 0.8 inch, and in breadth from 0.53 to 0.58 inch; but the average of five eggs is 0.76 by 0.56 inch.

579. *Stoparola melanops* (Vigors). *The Verditer Flycatcher*.

Eumyias melanops (Vig.), *Jerd. B. Ind. i*, p. 463.

Stoparola melanops (Vig.), *Hume, Rough Draft N. & E.* no. 301.

The Verditer Flycatcher breeds throughout the outer ranges of the Himalayas at elevations of from 4500 to 9000 feet, from Assam to Afghanistan. They lay from April till the middle of July.

The nests of this species that I have seen in the neighbourhood of Simla were soft masses of moss, lined with very fine moss-roots, or composed almost entirely of these latter, measuring 4 or 5 inches in diameter externally, and with a central depression about 2 to 3 inches in diameter and about 1 to 1½ inch in depth, in which the eggs were placed. The nests rather convey the idea of a mass of materials having been heaped together, and the birds having formed the egg-cavity by pressure on the centre of the mass, than of having been regularly built in the usual acceptation of the word. Nests, found on the 19th April and the 25th May near Kunglwe (Darjeeling), at a height of about 5000 feet, the one in a crevice of a rock, the other in the wall of a shed, were precisely as above described; but at times they are more regularly cup-shaped. As to the localities in which the nest is placed, the following notes sufficiently explain this; but I would mention that I have once seen one, as figured by Mr. Hodgson, resting on the fork of a branch. Four is certainly the normal number of the eggs.

From Murree Colonel C. H. T. Marshall writes:—"The Verditer Flycatcher always builds under the small wooden bridges that cross the hill-paths. We found more than half a dozen nests all situated under these bridges. The eggs are pale pink and sometimes have a few fine speckles on them. Breeds in June, at an elevation from 4000 to 7000 feet."

From Dhurmsala Captain Cock sent me the following note:—"Nidificates in April and May in the North-west Himalayas. Nest is composed of green moss externally, lined with black fibres, cup-shaped and deep, diameter of the inside of the cup from 2½ inches to 2½. Nest is usually placed by the side of a road or nullah under some very overhanging bank, often under some low bridge of the hill-roads on one of the rough supports. On two occasions I found the nests in decayed trees, but never at a height of more than 5 feet from the ground. Parent birds sit very close, and may sometimes be caught on the nest. Lays four eggs; when fresh of a pinky white, with minute faint brick-red marks, having a tendency to form a zone round the larger end. After they have been blown, the egg becomes a very faint buff-colour, with the aforesaid marks."

At Mussoorie Captain Hutton records that this "is a common species throughout the mountains up to about 12,000 feet during summer, arriving about the beginning of March. It breeds in May and June, making a neat nest of green moss in holes of trees, in

stumps, and in the holes of banks by the roadside. The eggs are three or four in number, dull white, with faint rufous specks at the larger end, and somewhat inclined to form a ring."

From Almora we hear from Mr. Brooks that "the nest is usually placed in a hole in a steep bank-side, at a tree-root, or hole in the wall of some unfrequented building, under the rafters of the verandah of a dwelling-house, and under the eaves of a house-roof. Once I found one in a small niche inside a small building, or cover built over a well or spring, the size of the little building, which had a domed roof, being about 6 feet square. The floor was *water*, about 3 feet deep, and directly opposite the door was the small niche in the wall, about 8 inches wide, and here the bird sat on its nest in full view of every native who came to draw water. The nest is composed of moss and fine fibres and lined with hair; eggs four, colour fleshy white, clouded and finely mottled with pale reddish brown at the large end. The egg much resembles some light-coloured varieties of that of the English Robin. Laying in Kumaon from 11th May to middle of June."

"At Nynsee Tal," says Mr. R. Thompson, "it lays in April, May, and June. It builds on the ground, in holes in banks, corners and holes in rocks, but most frequently under a bridge, in the timbers of which, if it finds a hole, there it will most assuredly make its nest. This latter is circular, cup-shaped, and composed of coarse grass, roots, moss, hair, and fibres. It averages some 4 inches in diameter. The eggs are usually four in number. It breeds at all elevations from 3500 feet and upwards. I have most frequently found the nest placed under a bridge of the common sort made over small streams in our hills. One bred under a bridge near my house in several successive years, and always had four eggs in the nest."

Dr. Jerdon states that "it breeds at Darjeeling occasionally in the eaves of houses, but generally on a bank; makes a neat nest of moss, lined with black fibres and hair, and has generally four eggs, dull white, with small rufous spots."

Mr. Gammie says:—"I took a nest of this species out of an indentation in a dry overhanging bank on the 30th April, 1873. This was at Bishap, at an elevation of about 3000 feet. It contained three fresh eggs. The eggs and nest were of the usual type."

Colonel Godwin-Austen tells us that this species "breeds in the Khasi Hills, on the Shillong or northern side, in April. Young birds well-fledged were brought in to me in the middle of May."

In shape the eggs are a moderately broad oval, somewhat compressed towards the smaller end. The ground-colour is pinky white, in some entirely devoid of markings, in others with a more or less conspicuous reddish-pink zone or cap of mottled or clouded speckly markings, generally nearly confluent. These eggs have little or no gloss, and obviously belong to the same type as those of *Niltava*. The want of distinctness in the markings separates them from those of *Terpsiphone paradisi*, *Dicrurus ater*, and the like.

The colouring is a clouded zone or cap at the best, never defined specks or spots.

In length the eggs vary from 0.72 to 0.85 inch, and in breadth from 0.46 to 0.62 inch; but the average of a very large series is 0.78 nearly by 0.57 inch.

580. *Stoparola sordida* (Ald.). *The Dusky-Blue Flycatcher.*

Stoparola sordida (Wald.), *Hume, Cat. no. 302 bis.*

Mr. Bligh, as quoted by Colonel Legge in his 'Birds of Ceylon,' says:—"The nest is generally in various suitable places, such as a shallow hole in a rotten stump or in the trunk of a forest tree; and I once found it in a felled tree well protected by a thick branch of a coffee-bush which grew over it. It is composed of moss, lichens, and grasses, lined with fine fibrous materials, and is like a Blackbird's in miniature. The eggs are dull white, thickly sprinkled and blotched with dark reddish." Colonel Legge adds that the breeding-season in Ceylon would appear to be in April and May.

581. *Stoparola albicaudata* (Jerd.). *The Nilghiri Blue Flycatcher.*

Eumyias albicaudata (Jerd.), *Jerd. B. Ind. i, p. 464.*

Stoparola albicaudata (Jerd.), *Hume, Rough Draft N. & E. no. 302.*

So far as we yet know, the Nilghiri Blue Flycatcher breeds only on the Nilghiris, at Ooty, Conoor, Neddiwattam, Kartairy, Kotagherry, and other places, from about 3800 to 6200 feet above the sea. It also breeds in the Pulneys.

Nests of this species, sent me from the Nilghiris, and found in holes or depressions of banks, were soft masses of beautiful moss, with a slight substructure of coarse moss and lichen, measuring some 5 inches in external diameter, and with slight depressions some 2½ inches in diameter and perhaps 1 inch in depth towards one side. The egg-cavity could not be said to be lined, but a greater proportion of very fine black moss-roots entered into the composition of the nest here than elsewhere.

I have never taken the nests of this species myself, and I shall leave my correspondents to give their own accounts of its nidification.

Miss Cockburn says:—"I have had the pleasure of finding three of the Blue Flycatchers' nests. The first one was built in a bower (not far from our house), the walls of which, being of stone and having many little holes, a pair of these birds had chosen a snug one to hatch their young in. The other two nests were in holes in the banks of roads. All were extremely neatly

built with moss, and lined with hair, and were made very warm and comfortable. They always lay four eggs of a light fawn-colour, the circle at the thick end being a darker shade. The months in which they breed are March and April."

Mr. W. Davison remarks :—" *Stoparola albicaulata* breeds on the Nilghiris in the latter end of April and May ; it nests in holes, either of trees or banks, not unfrequently under the eaves of houses. The nest is built entirely and always of green moss ; the egg-cavity lined with moss-roots. The eggs, generally three in number, are of a pale salmon-pink, indistinctly ringed at the larger end and sparingly spotted over the entire surface with a somewhat darker shade. These eggs vary very much in shade of colour, sometimes being very dark, at others nearly white ; during the breeding-season the males are continually singing, though the song is not much to speak of."

Mr. H. R. P. Carter writes :—" On the 12th March I found one egg in a nest near Conoor ; on the 13th a second had been laid. I tried to catch the bird on the nest several times, but failed, and on the 17th I shot it. The nest was placed in a hole in a small cutting made to level a road, $2\frac{1}{2}$ feet from the ground. It was cup-shaped, and composed of coarse moss with no lining. I think three eggs seem to be the normal number. The eggs have a yellowish-white ground, mottled brownish at one end, and with very faint mottlings all over. This bird is very shy. I tried several times to catch it with horse-hair nooses, but without success, as it never came to the nest whilst they were set. It always builds in banks. On the 1st April I found a nest in a cutting by the side of a road near Conoor with three young ones about nine days old."

Mr. J. L. Darling, Junior, tells us that this species nests "in banks, trees, rocks, in any convenient hole, at all heights from the ground, sometimes as high as 30 feet. I have found two nests in bridges between the planking and beams, and two under the eaves of houses. The nest is round, and is built entirely of moss ; very rarely a few twigs are used as a foundation. There is no regular lining, but sometimes a few of the breast-feathers of the bird do duty as such. The nest may measure on the outside from 4 to 6 inches in diameter, inside from 2 to $2\frac{1}{2}$ inches in diameter, 2 in depth. The eggs are from two to four in number, generally three, rather oblong in shape, about $\frac{1}{4}$ inch in length, and little less than $\frac{1}{8}$ inch in breadth.

"The colour is whitish brown, getting darker towards the thick end. There are sometimes specks of brown. The eggs might be mistaken by an inexperienced person for those of the Orange-and-black Flycatcher."

Mr. Rhodes W. Morgan, writing from South India, says :—"It breeds in holes of trees from February to May. The nest is constructed of moss, and is lined with fine fibres. The eggs are from two to three in number, being almost entirely covered with numerous pale rusty-red spots running into one another, some-

times forming a zone at the larger end, at others so completely covering the egg as to give it the appearance of being entirely of a reddish pink, the colour being always darker towards the larger end. Dimensions of an egg $\cdot 85$ inch by $\cdot 54$."

Capt. Horace Terry remarks of this bird on the Pulneys :— "Kodikanal, Pulungi, and Kukal; got a nest at Kodikanal in June with two hard-set eggs."

The eggs, of which many have been sent me, vary a good deal in size, shape, and colour, but they are almost without exception larger and more highly coloured than those of *S. melanops*. They belong of course to the same type as these and *Niltava*. In shape they are elongated, at times excessively elongated, ovals, with normally little or no gloss. The ground-colour varies from creamy-white to a pretty warm *café au lait* colour. In some eggs there are no discernible markings; only the tint grows deeper and brighter towards the large end, with pale reddish brown, brownish red, or red, as the case may be. In some few eggs there is a regular zone of minute red specks round the large end. In length the eggs vary from $0\cdot 76$ to $0\cdot 88$ inch, and in breadth from $0\cdot 55$ to $0\cdot 62$ inch, but the average of some fifty eggs is $0\cdot 81$ nearly by $0\cdot 59$ inch nearly.

583. *Anthipes moniliger* (Hodgs.). *The Himalayan White-gorgeted Flycatcher.*

Anthipes moniliger (Hodgs.), *Jerd. B. Ind i*, p. 477; *Hume, Cat.* no. 317.

Mr. Mandelli has sent me two nests said to belong to this species. One was found at Lebong at an elevation of about 5800 feet on the 13th May, when it contained four fresh eggs. The nest was placed in a depression of the ground in the midst of grass and low jungle. The other was found in June near the same place, on the ground also amongst the grass on a bank. The one nest is a shallow saucer composed of very fine moss closely felted together, and with a few dry grass and dead leaves incorporated at the base, also one or two feathers. It is about $3\cdot 5$ inches in diameter, with a small central depression, and a little excessively fine grass is intermingled with the moss on the whole upper surface. The other is very similar but slightly larger, and has the whole base and sides completely coated externally with dead semi-skeleton leaves.

Mr. Mandelli has also sent me eggs said to belong to this species, obtained near Darjeeling on the 3rd of April. I am scarcely inclined to believe in the authenticity of these eggs.

They are moderately broad ovals, somewhat pointed towards the small end, with a very fine compact and glossy shell. The ground-colour is nearly-pure white, there is a conspicuous freckled streaky brownish-red zone about the large end, and spots, specks, and tiny streaks of the same colour sparsely scattered about the rest of the

surface of the egg. A few purple spots are intermingled with the red markings of the zone.

The eggs measure 0.72 by 0.53 and 0.75 by 0.55 *.

591. *Ochromela nigrirufa* (Jerd.). *The Black-and-Orange Flycatcher.*

Ochromela nigrirufa (Jerd.), *Jerd. B. Ind.* i, p. 462; *Hume, Rough Draft N. & E.* no. 300.

The Black-and-Orange Flycatcher breeds on the hills of Southern India, at elevations of from 5000 to 7000 feet. It lays from March to May, two being the normal number of the eggs, but three being occasionally found. A nest of this species, taken by Mr. Carter at Coonoor, in the Nilghiris, is a very remarkable structure for a bird of this species. It is a huge coarse ball-like nest, made of dry sedge-stems, and very coarse marsh-grass, on a foundation of dead leaves. It is almost incredible at first sight that this nest should really belong to this bird, but this is the normal type of nest, of which I have now seen many. The nest itself has an external diameter of at least 6 inches, and the egg-cavity, which is near the centre of the nest, and which is devoid of lining, is about 2½ inches in diameter, and fully 2½ inches deep. Other nests taken by Miss Cockburn and Mr. Davison are precisely similar in character,—regular balls of dry sedge and coarse grass, wedged in usually to the centre of a bush, with a small entrance-hole at one side near the top, and entirely devoid of lining, usually with more or less dry leaves as a foundation to the ball.

Mr. J. L. Darling, Junior, says:—"I have taken the eggs in March, April, and May in 1870-71-72, at Ooty, Coonoor, and Kotagherry, at elevations of from 5000 to 7000 feet. The nest is placed in thick clumps. The bird is fond of building in the cluster of new shoots that rise from the stump of a tree that has been felled. Usually, the nests are at heights of from 1 to 3 feet from the ground; but I have found one placed actually on the ground. The nest is globular, higher than it is wide, with a small entrance-hole at one side, *below* which the nest is a little drawn in and *above* which the dome projects somewhat. The foundation of the nest is almost always composed of dry leaves and fern, and the rest of it is woven of reed-leaves and flags. There is no lining; the eggs rest upon the soft reed-leaves. The nest exteriorly is about 6 or 7 inches high and 4 broad, and the diameter of the central spherical cavity is perhaps 3 inches. The eggs are always two in number,

* *ALBONAX RUFICAUDUS* (Swains.).

Oyornis ruficauda (Sw.), *Jerd. B. Ind.* i, p. 468.

Major Wardlaw Ramsay says, writing of Afghanistan:—"Common, and breeding as it was in May, June, and July, I never had the luck to find its nest."

a dirty-white, somewhat brownish ground, shaded more with reddish brown towards and at the large end."

Mr. Davison says :—"The nest of this bird is quite unlike that of any of the Flycatchers with which I am acquainted ; it is (for the size of the bird) a *large* globular structure, composed chiefly of the dry leaves of a kind of reed common on the Nilghiris and its slopes ; the opening is near the top, and the egg-cavity is very deep ; the eggs, two or three in number, of the true Flycatcher type, being of a pale brownish-salmon colour, indistinctly mottled with a darker colour, the markings coalescing to form a zone or cap at the larger end. Usually it lays only two eggs, but I have taken three. It is a permanent resident from 5000 feet to the summit of the Nilghiris, and when found at a lower elevation than 5000 feet, I believe it is only as a straggler. It breeds from April to the early part of June. The nest is usually placed close to the ground in a clump of ferns or reeds, or some similar situation."

Miss Cockburn remarks :—"The Orange Flycatcher had chosen a clump of reeds, in which they had built their nest (rather a large one for so small a bird). The shoots of the reeds were growing all round. It was commenced with large pieces of dry common fern-leaves and continued with a quantity of dry grass, some of which was brought so as to form a hood over the small round opening left at one side. The interior was lined with very fine grass, but contained nothing soft or warm. This nest was found on the 11th of May, and another found on the last day of the same month was built with exactly the same materials."

Mr. Rhodes W. Morgan, writing from South India, says :—"This very beautiful little Flycatcher breeds in ravines where the shade and cover is very dense. The nest is built entirely of bamboo-leaves, and is lined with fine fibres. It is placed very low down, from six inches to two feet from the ground ; a clump of fern is a very favourite situation. The eggs are two in number, and are very minutely and thickly speckled with faint reddish brown on a pale olive ground, the whole of the upper part having a regular cap of reddish brown. Dimensions of one, 0.74 inch in length by 0.54 in breadth."

Mr. T. Fulton Bourdillon, writing from the Mynall Estate in Travancore on the 29th March, says :—"Two nests, each containing two fresh eggs, and a new nest, all found in dense jungle at an elevation of 3700 to 4000 feet. The bird is not uncommon here. The nests were composed of the leaves of the *cerul* (a reed peculiar to the Western Ghâts, which has been called *Beesha travancorica*), and domed. From 3 to 8 feet from the ground. Size of egg 0.65 inch by 0.5."

The first egg of this species which I obtained I owed to Messrs. H. Carter and Wait, who sent it from Conoor (Nilghiris). It is a long oval egg, an exact miniature of some eggs of *Myiophonus temmincki*, but also having obvious affinities with the *Stoparola* and *Niltava* group. The shell is very fine and delicate, with a very faint gloss. The ground is a pale greyish white, thickly and very

finely speckled and mottled all over with very faint brownish red, which speckling becomes confluent towards the larger end, forming a dull, irregular, pale brownish-red cap. Other specimens, received from Miss Cockburn and Mr. Davison, are similar in colour to that already described, but are somewhat broader and less elongated ovals in shape. In some eggs the markings are almost exclusively confined to the larger end, where they form a confluent pale, apparently half-washed out, brownish-pink cap.

The eggs vary in length from 0.65 to 0.75 inch, and in breadth from 0.46 to 0.58 inch, but the average is 0.7 by 0.53 inch.

592. *Culicicapa ceylonensis* (Swains.). *The Grey-headed Flycatcher.*

Cryptolopha cinereocapilla (Vieill.), *Jerd. B. Ind.* i, p. 455.

Myiactes cinereocapilla (Vieill.), *Hume, Rough Draft N. & E.* no. 295.

The Grey-headed Flycatcher breeds everywhere in the outer ranges of the Himalayas from 4000 to 7000 feet, in the Wynnad at an elevation of some 3500, and throughout the Nilghiris from an elevation of from 4500 quite to the summits, wherever there is any jungle or forest. It lays during the latter part of April, May, and June; four being, I think, the normal number of the eggs, but three being often the full complement.

The nests, very fully described by my different correspondents, are constructed amidst the growing moss on some perpendicular rock or old trunk of a tree. One now before me, found near Kotagherry on the 20th May, 1871, on a rock near water, about 6 feet above the ground, is a deep massive little cup of moss felted together, a little white and green lichen being intermingled with the moss; externally it is about 2½ inches in diameter and more than 3 inches in height. The cavity is not lined in any way, and is a little more than 1 inch in diameter, and perhaps 2 inches in depth. When *in situ* this nest was of course covered externally with a great deal of loose moss, which was blended with that growing on the rock. Usually they may be briefly described as quarters of spheres placed against upright surfaces, with rather deeper than hemispherical cavities, composed entirely of moss and lichen.

Colonel G. F. L. Marshall writes:—"I have found many nests of this species at Naini Tal. I think they must have two broods in the year; I have as a rule reached the hills in the middle of May and until this year I never got eggs or saw any sign of building till the first week in July, though I watched the birds carefully. This year I came up in the middle of April and found several nests with eggs before the first week in May, and again they are building in the end of June. The bird is very common here, but the nest is almost impossible to see from the ground unless the spot is betrayed by the movements of the birds. All that I have seen without exception were against the moss-covered trunks of large hill-oaks about 30 feet from the ground and unsheltered by foliage."

From Sikhim Mr. Gammie writes:—"I have found this species breeding in open forests in May and June, at about 5000 feet above the sea. One nest found on the 10th June contained four fresh eggs and was placed in a longitudinal scar on the underside of a large leaning tree (not moss-covered), about four feet from the ground. Outwardly it somewhat resembled the half of an inverted cone split downwards, and measured externally 9 inches in length by $3\frac{1}{2}$ across the top. Halfway down the breadth was 1 inch less. The cavity was 1.5 inches in diameter by 1.3 in depth. It was neatly made of moss bound together by cobwebs, and attached to the rough scaly bark of the tree by the same material. The outer moss was intermingled with a few lichens of the same colour as those growing naturally on the tree, and the cavity was most beautifully lined with the red fruiting-stalks of a small moss. I did not know before that moss fruit-stalks were of any further use (independent of their species) than being pretty to look at, but here we have a charming use both for them and the much despised cobwebs."

Messrs. Davidson and Wenden, speaking of the Deccan, say:—"Very common in Satara, and undoubtedly breeds there."

Mr. J. L. Darling, Junior, writes:—"This species breeds from April to May; it is found all over the Nilghiris above 4500 feet, and down in the Wynnad from (say) 3500 feet. It attaches its nest with cobwebs to the faces of tree-trunks and rocks at heights of from 7 to 30 feet above the ground. The nest is composed of moss and cobwebs, and has no lining. The outline of the upper surface is nearly semicircular, say about 5 or 6 inches in length, where it joins the rock and projecting some 4 inches. The cavity, which is in the middle of this, is quite circular and deeper than it is wide. The profile of the nest is a quarter of a circle, and externally it is from 4 to 6 inches deep. They lay from three to four eggs; more generally, I think, the former number."

Mr. Davison remarks:—"This bird breeds commonly on the Nilghiris in April and May, choosing as a site for the nest some moss-covered trunk of a tree or rock, against which the nest is placed; it is composed entirely of green moss, lined with moss-roots; it is so constructed that it appears like an ordinary lump of moss. The egg-cavity is very deep, the bird when sitting being invisible at a distance of only a few paces. The eggs are three in number; sometimes, though very seldom, four; white, ringed at the larger end with indistinct spots of a blackish grey, and with a few spots of the same colour sparingly scattered over the entire surface of the egg."

Writing from Kotagherry, Miss Cockburn tells us that "these Flycatchers generally choose the perpendicular sides of rocks on which there is a quantity of green moss as places to build on, and form their pretty little abodes (which in shape somewhat resemble that of a swallow) of moss and cobweb, which makes them difficult to distinguish and impossible to remove uninjured. They build in the month of April and lay four eggs of a light grey, which have

the dark streaks and blotches, mostly at the *thick* end, so peculiar to all Flycatchers' eggs."

Captain Hutton remarks:—"I took a nest of this species on 18th April, 1848, in a deep and thickly wooded glen at an elevation of 4500 feet. It was placed against the moss-covered trunk of a large tree, growing by the side of a mountain-stream, and was neatly and beautifully constructed of green moss, fixed in the shape of a watch-pocket at the head of a bed to the mosses of the tree (with which it was completely blended) by numerous threads of spiders' webs. The lining was of the finest grass-stalks, no thicker than horsehair, and beneath the body of the nest depended a long bunch of mosses, fastened to the tree with spiders' webs, and serving as a support or cushion on which the nest rested securely. Within this beautifully constructed fabric were four small eggs of a dull white colour, with a faint olive tinge, and minutely spotted with pale greenish brown, and having a broad and well-defined ring of the same near the larger end. The eggs were set hard."

Writing from Murree, Colonel C. H. T. Marshall says:—"Several nests answering to Jerdon's (*i. e.* *Hutton's*) description, like watch-pockets fastened up on the trees, 6000 to 7000 feet up."

Mr. Rhodes W. Morgan, writing from South India, says:—"This Flycatcher breeds in March and April, building a nest of fine moss, which is attached like a pocket to the mossy trunk of some large shola tree. The nest is almost invariably built under a branch or some other projection to shelter it from the rain, and is very securely attached with cobwebs to prevent it from being blown down. The eggs are almost always three in number, of a very faint greenish-grey colour, with a wide zone of the same (but darker) colour at the larger end. Dimensions of one 0.62 inch in length by 0.51 in breadth. I have never found its nest on the plains."

The eggs are moderately broad ovals, scarcely compressed towards the smaller end. The ground-colour varies from white to a dingy yellowish white, and they have a broad conspicuous confluent zone of spots and blotches towards the large end, the colour of which is a mottled combination of dingy yellowish brown and dingy purplish or brownish grey. The rest of the egg is more or less thickly or thinly spotted, speckled, or freckled with very pale dingy brown. The eggs sometimes have a slight gloss, but more commonly are almost glossless.

In length they vary from 0.58 to 0.65 of an inch, and in breadth from 0.46 to 0.5 of an inch, but the average of a large series is 0.61 by 0.48, nearly.

593. *Niltava grandis* (Blyth). *The Large Niltava.*

Niltava grandis (Bl.), *Jerd. B. Ind. i*, p. 470; *Hume, Rough Draft N. & E.* no. 316.

Dr. Jerdon observes of the Great Niltava that "its nest is very like that of *N. sundara*, being loosely made of moss, and placed in similar situations, and the eggs only differ in their larger size.

When the nest is placed on the cleft of a rock, the shape of the nest is accommodated to it, so that I have seen the nest shaped like a parallelogram, long, quite flat on the sides, and the two ends just slightly rounded."

In Nepal, according to Mr. Hodgson's notes, this species lays during April and May, building a more or less massive nest of green moss and lichen, lined with fine moss-roots. The dimensions of one nest are recorded as—external diameter 4.5 inches, height 2.5, diameter of cavity 2.65, depth 1.5 inches, but they are said to be often larger. They are placed on the branch of some tree, between three or four slender shoots, at an elevation of a few feet above the ground, or at other times in some hole of a decaying tree or on some ledge of rock. They lay four buffy eggs, measuring about 1 inch in length by about 0.73. They have only one brood in the year, and the young are fledged and ready to fly about the middle of July.

From Sikkim Mr. Gammie writes :—"I have seen several nests of this bird, but have only once taken the eggs. It breeds in May and June, in forests from 4000 to 7000 feet of elevation, and lays four eggs. A favourite position for the nest is against the side of a gigantic buttressed tree, about four or five feet up, in the angle formed by two of the buttresses. It also builds in clefts of rocks and similar positions. The nest is made of green moss lined with black fibrous roots, and measures externally 4.5 inches in width by 3.2 in depth; internally the cavity is 3 inches in diameter by 1.9 deep.

"Though this Flycatcher is often seen about Darjeeling, yet numerically it is rather rare. It is very solitary; except at the breeding-season, rarely more than one individual being seen at a time. It is naturally a shy and silent bird, but becomes bold and noisy when its nest or young is approached, at such times both male and female will come quite close to the intruder, uttering their plaintive whistling complaints."

A beautiful nest of this species taken on the 21st May by Mr. Gammie at Rishap, at an elevation of 5000 feet, contained three fresh eggs. It was built about 4 feet from the ground on the side of a large moss-covered tree between two small buttresses. It is a massive structure of green moss closely felted together everywhere, fully 1 inch in thickness. The cavity is entirely lined with black fern-roots strongly felted together, and measures 2.5 inches in diameter by 1.5 in depth.

The general character of the eggs is much that of those of *N. sundara*, *Stoparola melanops*, and *S. albicaudata*. I have never taken the eggs myself, but those that I have received from Dr. Jerdon and Capt. Masson from Darjeeling differ slightly in size, as well as in intensity of colouring.

Those that Dr. Jerdon gave me are larger than those sent me with nests and female birds by Captain Masson, averaging 1.04 inch in length by 0.73 inch against 0.96 in length by 0.72 inch in breadth, which is what Captain Masson's eggs average.

In shape all the eggs are much alike, being long regular ovals, only slightly compressed towards one end, and they have all a very faint gloss. The eggs brought me by Dr. Jerdon are of a uniform very pale fawn or dingy pinkish-white colour, faintly clouded at the large end with reddish pink. Captain Masson's eggs have a sort of pale buffy-white ground, more or less streaked, clouded, or suffused, chiefly at the large end, with buffy-fawn colour. Both doubtless belong to this species.

Eggs sent me by Mr. Gammie are very broad ovals, slightly compressed towards one end, but very obtuse at both. Looked at from a little distance they are a very pale *café au lait* colour, darker and slightly pinky in a broad undefined zone about the large end. Looked into very closely they seem to have a creamy ground and to be very faintly and closely freckled and mottled over, most densely in the zone already referred to, with a sort of pale pinkish brown.

These eggs vary from 0·87 to 0·91 and from 0·7 to 0·73.

Another egg subsequently obtained by him measures 0·89 by 0·69.

Other eggs again obtained by Mr. Gammie were altogether paler, in fact white with the faintest possible pinkish-brown tinge, scarcely perceptibly darker at the larger end.

These eggs measure 0·93 and 0·99 by 0·7.

594. *Niltava sundara*, Hodgs. *The Rufous-bellied Niltava*.

Niltava sundara, Hodgs., *Jerd. B. Ind.* i, p. 473, *Hume, Rough Draft N. & E.* no. 314.

The Rufous-bellied *Niltava* breeds everywhere in the Himalayas, at any rate from Darjeeling to the valley of the Beas (I have no record of its breeding further west), from the middle of April to the middle of May. It places its nest in some rocky ledge or crevice, or in or about some decayed stump or fallen trunk.

A nest of this species, which I took near Kotegurh on the 15th May, was a mere pad of moss, about 5 inches in diameter and 1½ inch in thickness, with a very broad shallow depression in the centre. In and about the inner surface of this depression a certain amount of very fine silky fur and one or two downy feathers were interwoven, making a kind of lining. The nest was placed in a hollow at the base of an aged oak. Four is, I believe, the normal number of the eggs.

According to Mr. Hodgson's notes and drawings this species lays in Nepal in April and May. It constructs its nest, which is compact and large for the size of the bird, of green moss, lined with black moss-roots; it measures exteriorly about 5 inches in diameter and 3 in height; the cavity is about 2·5 inches in diameter. Of another nest he gives the external diameter as 4·5 inches, height 3; internal cavity, diameter and depth 1·5. The nest is placed against the root of some tree or on some ledge of rock, or in some crevice in a cliff or bank. Three or four eggs are laid, measuring about 0·9 by 0·65 inch, of a nearly uniform pinky-fawn colour, slightly darker towards the large end.

"At Darjeeling," Dr. Jerdon says, "I several times procured the nest of this bird, situated on a bank, or in the cleft of a rock, or against the fallen stump of a tree. It is loosely made of moss, lined with a few black fibres; and the eggs, three or four in number, are reddish white, with the large end nearly covered with minute brick-red spots, forming a large patch of dull brick-red. The eggs are remarkably long-shaped."

Mr. Gammie says:—"I found a nest of this species in a cleft of a rock near Bungee, at an elevation of 3800 feet, on the 18th May. The nest was of the usual type—a pad of beautiful soft green moss, lined with the finest and softest moss-roots,—and contained three fresh eggs. These, though of the normal type of colouring, were quite abnormally small, measuring 0.77 and 0.8 inch in length, and 0.58 and 0.59 inch in breadth. We snared the bird on the nest, so that there could be no doubt about the species."

The eggs are commonly a rather long oval, somewhat pointed towards one end, but spherical and pyriform varieties occur; as usual in this family, they are almost entirely devoid of gloss. The ground-colour is a pale reddish buff, somewhat paler than that of *Stoparola albicaulata*, and the egg is throughout very faintly freckled and mottled with a sort of dingy pink, which is most apparent towards the large end. This mottling is only apparent when the eggs are closely looked into; at a little distance they appear a uniform very dingy pale buff, slightly darker towards the large end.

In length the eggs vary from 0.87 to 1 inch, and in breadth from 0.68 to 0.75 inch; but the average of a large series is 0.93 by 0.71 inch nearly.

595. *Niltava macgrigorise* (Burt.). *The Small Niltava.*

Niltava macgrigorise (Burt.), *Jerd. B. Ind. i*, p. 475; *Hume, Rough Draft N. & E.* no. 315.

The Small *Niltava* breeds in Nepal and Sikhim from April to June at elevations of from 3000 to 5000 feet.

The nests sent me from Darjeeling (along with the eggs and parent birds) closely resemble those of *Stoparola melanops* and *S. albicaudata*, but are larger and more carefully built. They were placed, I am informed, on the ground, and are composed of beautiful soft moss of different kinds, the egg-cavity being partially lined with excessively fine blackish-brown moss-roots. The nests are fully 5 inches in external diameter, and the egg-cavity is about 2½ inches in diameter and 1½ inch in depth. A few dead leaves are sometimes incorporated in the base of the nests, which otherwise are entirely composed of beautiful soft feathery mosses and their delicate roots.

One nest found at Rishap, Darjeeling, on the 7th May, at an elevation of 4000 feet, contained three fresh eggs, but four is, I believe, the full complement.

According to Mr. Hodgson this species breeds in Nepal in April and May, laying three or four unspotted pinkish or fawny-white eggs; the nest is entirely composed of green moss, in which fine

moss-roots are intermingled and is also lined with these. It is nearly globular in shape, from 3·5 to 4 inches in external diameter and fully 2 inches in height; the cavity is about 2 inches in diameter and 1 inch in depth. The nest is placed in some hole in a decaying prostrate trunk, or at the roots of some yet standing tree, or again on some ledge of rock. The young are ready to fly by July.

Eggs taken by Mr. Gammie vary a good deal in shape, but seem to be typically rather elongated ovals. As a rule they seem to have scarcely any gloss. The ground-colour varies from white to a pale brownish-stone colour. The markings always freckly and smudgy, and invariably densest in a zone or rarely a cap about the large end, equally vary very much in distinctness, intensity, and colour. In some they are very faint with a brownish purplish tinge, barely darker than the ground of the egg; in others they are a distinct brownish or reddish pink, here and there intermingled with brownish purple. In some eggs they form merely a faint cloud at the large end; in others they form a well-marked zone round this end, and extend pretty well over the whole surface of the egg.

Six eggs varied from 0·71 to 0·81 inch in length and from 0·5 to 0·56 in breadth.

598. *Terpsiphone paradisi* (Linn.) *The Indian Paradise Flycatcher.*

Tchitrea paradisi (Linn.), *Jerd. B. Ind.* 1, p. 445; *Hume, Rough Draft N. & E.* no. 288.

The Indian Rocket-bird or Paradise Flycatcher breeds throughout the exterior ranges of the Himalayas in the warmer valleys up to an elevation of 5500 feet; at any rate from Nepal to Afghanistan. Even at considerable distances in the interior, as about Almorah, Kotegurh, and the Sutlej Valley, Sooltanpoor, and the valley of the Beas, and Cashmere, it is common. Throughout the warm Sub-Himalayan forest-tracts, in the Doon, the Terai, and the northern portions of Rohilkund and Oudh, and in wooded portions of Jhansee, Saugor, Nimar, Raipoor, and doubtless other portions of the Central Provinces, it breeds, though more sparingly in these latter. It breeds in Southern India, but I have scanty information as to its nidification there, and neither Miss Cockburn, Mr. Davison, nor any other of my Nilghiri correspondents appear to have taken its nest there.

Alike in plains and hills it lays during May, June, and July. The nest is commonly a delicate little cup, never very deep, often rather shallow, composed, according to locality, of moss, moss-roots, vegetable fibres, and fine grass, which latter generally constitutes the greater portion of the framework, bound round exteriorly with cobwebs in which little white silky cocoons are often intermixed. Sometimes, owing to the situation in which it is placed between two or three upright twigs, the nest is exteriorly a broad inverted cone. I have one, taken in the Agrore Valley by Captain Unwin, that is exteriorly 4 inches deep and 3 inches in diameter at the upper rim; but, as a rule, the exterior depth does not exceed 2 inches, and the

cavity varies in diameter from 2 to 2.75, and in depth from 1 to 1.6. There is, not uncommonly, a good deal of horsehair woven in the interior surface of the cavity, and this, with the finer grass which is used in this part of the nest, forms a sort of lining. The walls of the nest are scarcely above $\frac{1}{2}$ inch in thickness, and where the nest rests, as it often does, on the flat surface of some broad horizontal bough, just where some twig (which is then firmly incorporated in the nest) rises perpendicularly or nearly so from that surface, the bottom of the nest is hardly thicker, but at times, when fitted in between two or three such twigs, it is as much as 2 or 2 $\frac{1}{2}$ inches in thickness. The nests in fact exhibit the forms of those of both *Rhipidura aureola* and *R. albicollis*, and though larger and perhaps, as a rule, somewhat less densely coated with cobwebs, closely resemble these, as they do also, in a somewhat less degree, those of *Egithina tiphia* and *Tephrodornis pondiceriana*.

The full number of eggs laid is four.

As to the plumage in which these birds breed, Mr. Gould says ('Birds of Asia') :—"I believe that when the long feathers have been once acquired by either sex, they are not again thrown off, and that they are not a seasonal or breeding characteristic, as some authors have supposed; the short-tailed birds, which are always chestnut, are very young birds."

This, according to my experience, is certainly wrong. I have taken from first to last some thirty nests, and in every case found the sitting female to be a short-tailed cinnamon-coloured bird, and in almost every case I found the male to be a long-tailed cinnamon-coloured bird. In a very few cases the males were white, and in a few parti-coloured.

Writing some years ago from Bareilly in June, I said :—"In the public gardens is a large circular reservoir, dry and empty during the hot season, but now half full of water; on the banks on one side are a number of sheeshum trees (*Dalbergia sissoo*), and on one of the outermost branches of these, at the very end, where the branch hangs nearly straight downwards, and where only one independent twig dissenting from its principal persists in growing straight upwards, there, between branch and twig, was placed a half egg-shaped nest, a mere shell, very closely and compactly woven of fine grass-roots and grass, thickly coated exteriorly with cobwebs, in amongst which a great number of small white empty cocoons had been interwoven. The nest was nowhere much above $\frac{1}{2}$ inch in thickness, and the cavity was about 2 $\frac{1}{2}$ inches in diameter at the margin and 1 $\frac{1}{2}$ inch deep. A nest we took the other day was seated on a horizontal branch of a mango tree, had horsehair and a little fine tow interwoven with the grass interiorly, and was a trifle smaller; exteriorly the two were precisely similar.

"On this nest, its head tucked close in, with only the beak projecting in front, but with the whole tail from the vent showing beyond the nest behind, sat a chestnut female, whose centre tail-feathers were not in the slightest degree elongated. The nest contained three fresh eggs, precisely similar to the four which we

took two days ago. They were white, with a very pale salmon-coloured tinge, with numerous dull red specks and spots, nearly all gathered into a large patch at the broad end, where they were partly confluent, and their interspaces filled up by a haze of a paler shade of the same colour, as if the colouring of the spots had partially run."

I took a lovely nest of this species on the 10th of May in the Calcutta Botanical Gardens. Exteriously it was a broad cone, base uppermost, 3 inches in diameter, and 3 inches in vertical height; interiorly a deep cup 2.5 in diameter and 1.7 in depth. The inside was a light basket-work of the finest grass-stems—there was no attempt at a lining. It was placed between two twigs, the main one down drooping, the smaller standing up and forming an angle of about 60°. Round the slight basket-nest and round these twigs was closely twined a series of firm bandages of vegetable fibre, and the whole was so closely plastered over with small white cocoons, bound on by their silk and with cobwebs, as to leave scarcely anything else visible. The twigs were quite at the outside of the tree, but the nest was well surrounded and concealed from view by surrounding leaves.

The nest contained four partly incubated eggs of the usual type. A short tailed chestnut female was sitting on the nest and a long-tailed chestnut male was close at hand.

Major C. T. Bingham writes:—"I found seven nests of this bird in a mango and peach garden here at Delhi on the 27th May and 12th June. Of these four were on peach-trees not above six feet from the ground, and three on mango-trees about fifteen feet from the ground. All the nests were beautifully made, firm, deep cups, plastered outside by tiny white cocoons and constructed of fibres of plantain and grass-roots—no lining. Five contained four eggs each, one five, and the seventh two rather hard-set ones. They are all white (rather a straw-coloured white), with reddish-brown spots chiefly at the larger end. Strange to say, the males belonging to the nest containing five and the nest containing two eggs were in chestnut garb, while the males of the other nests were white ones. The females in all seven cases were chestnut with white bellies and short tails. The average of 12 eggs was 0.8 inch in length by 0.65 inch in breadth."

Captain Hutton remarks:—"Several nests of this beautiful species were taken during the month of June in the Dehra Doon. They are generally perched high upon some tree that overhangs the side of a ravine, and are consequently somewhat difficult of access. The bird is likewise to be found during the summer months in some of the warmer valleys of the hills, and breeds up to an elevation of 5500 feet on the outer hills.

"The eggs are four in number, and white, sparingly dotted over with brick-red spots, with an open ring of the same at the large end. The nest is small, beautifully and compactly constructed of very fine blades of grass and a little green moss neatly interwoven into the shape of a small cup, and well plastered over externally with cobwebs; the lining is of very fine grass-stalks, sometimes

with the addition of a little horsehair. It is usually placed at the point where three or four twigs spring from the branch, and these are completely incorporated into the sides of the nest, the materials of which entirely envelope them, so that they appear protruding from, or through, the sides of the light and graceful fabric. They differ somewhat in point of size, some being rather larger and more open than others."

Mr. Brooks writes :—"Common in the villages about Almorah, seldom coming up to the elevation of the town itself. I have two males shot off the nest in the chestnut plumage. The nest is a neat cup-shaped one, fixed to a thin branch of a tree by means of fine grass and spiders' webs. It is composed of moss, fibres, and grass, and covered thickly outside with spiders' web. The internal diameter of the nest is about 2 inches, and it is lined with fine grass. The bottom of the nest now described rests on a small twig growing out of the thin branch to which the nest is bound. Number of eggs, three; $9\frac{1}{2}$ lines long by $7\frac{1}{2}$ lines broad, of a buffy white ground-colour, or more properly buff, sparingly spotted with reddish brown and purplish grey, tending to form a zone at the larger end in nearly every instance.

"It lays in Kumaon in the third week in May."

Dr. Scully, writing from Nepal, observes :—"In the valley it breeds in May and June, both sexes sharing in the incubation and feeding of the young. Many nests of this species were seen and taken in woods and gardens, but the account given in 'Nests and Eggs' is so complete that I need not take up space here by entering into long descriptions; I must note, however, that although the usual number of eggs laid is four, I have twice met with five eggs in a nest."

From Murree Colonel C. H. T. Marshall reports :—"We took ten nests in May, June, and July. The female was in *all* instances *chestnut*, with a white breast and short tail. This is one of the commonest nests to be got about Murree. Average elevation 5000 feet."

Dr. Henderson says :—"The Paradise Flycatcher was very abundant in Kashmir. Two nests were found, both on the forks of trees—one on an apple-tree, the other on a mulberry-tree, and high up in small branches. There was a single egg in one nest, and in the other four. The nests were made of very fine hair-like strips of mulberry-bark, with grass, moss, and cobwebs outside."

Major Wardlaw Ramsay says, writing of Afghanistan :—"Among the orchards at Shalofyan, in the Kurrum valley, it is especially abundant. I found it there in June, evidently breeding."

In Rajputana, Lieut. Barnes informs us that "the only nest of the Paradise Flycatcher that I found was in June and it was not quite finished. I sent a shikaree a week later to examine it, when it contained a single egg, which he brought in."

Professor Littledale, writing about the birds of Baroda, says :—"The Paradise Flycatcher is very common here during the rains, when it breeds. In all instances, except one out of nine nests that

I found with eggs last June and July, the birds were in the chestnut plumage, and in that one case the male was white and the female chestnut. The Mynas destroyed three nests of one pair of Paradise Flycatchers that built in a mango-tree near my house. I saw the little Flycatcher defend her first nest for nearly twenty minutes against a Myna that at last retired. Next day, however, the nest was torn to bits, by the Myna I suppose. It was twice rebuilt on other branches of the same tree, with the same result."

The only note I have on the breeding of this bird in Southern India is one by Mr. C. J. W. Taylor, who remarks that it breeds in Mysore in July.

Colonel Legge writes of the nidification of this bird in Ceylon:—"Mr. Parker writes me that the Paradise Flycatcher breeds about Madewatchiya in April and May. Layard mentions having found a nest at Tangalla, in the fork of a satinwood tree, and that the nest was 'a neat well-built cup-shaped structure, composed externally of mosses and lichens and lined with hair and wool'"

The eggs are miniatures of the warmer-coloured types of *Buchanga ater*; in shape they are, like these, typically a rather long oval, somewhat pointed towards one end. The ground-colour varies from pale pinkish white to a warm salmon-pink, and they are more or less thickly speckled, chiefly at the large end (where there is a tendency to form an irregular cap), with rather bright, but somewhat brownish-red, spots. Amongst the markings at the larger end a few tiny, pale, inky-purple blotches often occur. There is often a faint gloss on some of the eggs, but, as a rule, they are dull and glossless like the rest of the eggs of this family. I have seen eggs of the European Spotted Flycatcher not differing very widely from these except in shape, the eggs of the European bird being typically shorter, if not broader.

In length the eggs vary from 0.75 to 0.85 inch and in breadth from 0.56 to 0.65 inch, but the average of twenty eggs is 0.81 by 0.6 inch.

599. *Terpsiphone affinis* (Hay). *The Burmese Paradise Flycatcher.*

Tchitrea affinis (Hay), *Jerd. B. Ind. i*, p. 448.

Muscipeta affinis (Hay), *Hume, Cat.* no. 289.

Writing from Pegu, Mr. Oates says:—"This species is common in the hills and not rare in the plains. It may occasionally be seen in the cholera-camp hills in Thayetmyo; the males in April are generally in the chestnut plumage, but a fine male shot on the 21st May, which was undoubtedly breeding, was in the white plumage.

"I found the nest in the evergreen forests of the Pegu Hills on the 30th April. It was placed near the top of a small sparsely branched sapling.

"The interior of the nest is a perfect hemisphere; exteriorly the depth is rather greater than the diameter—

Interior diameter, about $2\frac{1}{2}$ inches.

Exterior ,, ,, $3\frac{1}{2}$ to 4 inches.

"The foundation and exterior were formed almost entirely of dry bamboo-leaves, well curved to shape, and rather coarse fibres; the interior was formed with fine fibres and a few grass-stalks. There were two eggs, quite fresh, both measuring $\cdot75 \times \cdot58$; both male and female birds were in chestnut plumage. The female when sitting has the whole head and tail projecting over the nest. The male has a loud harsh chatter, incessantly uttered when any one comes near the nest."

Mr. J. Darling, Jun., writes:—"21st April. Found a nest just building, three feet from ground, in a fork of a small sapling in bamboo jungle, east of Tavoy."

Two beautiful little nests are sent me by Mr. Gammie as belonging to this species, but differ so much from those of the allied species that, as he did not take them with his own hands, I must consider that their authenticity requires confirmation.

The nests were taken in the Teesta valley in April, at an elevation of 500-700 feet only above sea-level. They are deep cups, about 2.5 inches in diameter and 1.75 in height exteriorly, and with cavities about 2 in diameter and 1.3 in depth. They are composed of fine blades of grass wound carefully round and round, and completely though thinly coated with moss, firmly held in its place by a few strings of cobweb. The one is lined entirely with excessively fine brown hair-like grass and rootlets, the other with fine black (?) fern-stems, which I took to be horsehairs until burning one I found that it was vegetable matter.

Two eggs sent me by Mr. Gammie are moderately elongated ovals, a little pointed towards one end. The shells are very fine, but have only a slight gloss. The ground-colour is pinky white, and they are sparingly speckled, chiefly in an irregular ill-defined zone round the large end, where in one egg the specks are rather densely set, with pale, slightly brownish, red. In and about the zone a few pale purple specks and tiny clouds are noticeable.

The eggs are very similar to those of *T. paradisi*, moderately broad ovals, obtuse at one end, somewhat pointed towards the other, the shells fine and delicate, but compact and strong, and with a perceptible though not striking gloss. The ground-colour is a pinky cream, and they are profusely speckled and spotted in an irregular imperfect zone about the large end, and thinly elsewhere, with red, sometimes bright, sometimes slightly brownish, and more sparingly with pale purple or purplish grey.

Six eggs vary in length from 0.79 to 0.89 and in breadth from 0.6 to 0.62.

601. *Hypothymis azurea* (Bodd.). *The Indian Black-naped Flycatcher.*

Myiagra azurea (Bodd.), *Jerd. B. Ind. i*, p. 450; *Hume, Rough Draft N. & E.* no. 290.

The Indian Black-naped Flycatcher breeds in the low, warm, well-wooded valleys of the Sub-Himalayan Ranges to a height of

about 3000 feet, in the forest-tracts at their bases, and generally throughout India and Burma. They lay from May to August, but the majority of them, I believe, in June and the early part of July. Five is, I believe, the maximum number of eggs, and four the normal number.

The nests are usually placed in slender forks of the exterior branches of trees, at no great height from the ground, or attached to some pendent bamboo-spray. They are deep, compact little cups, more massive than those of the *Rhipidura*, though much of the same general type. The diameter of the cavity is from 1.5 to 1.75 inch, the depth from 1 to nearly 1½, and the sides and bottom of the nest may be about ⅝ inch thick. The nest is composed internally of fine grass-stems, well woven together; externally of rather coarser grass and vegetable fibres; the whole partially coated with cobwebs, by which numerous small white cocoons and commonly some tiny pieces of dry leaves and lichen are attached to the nest. In nests from the Nilghiris (found on the 10th and 24th June, placed as usual in forks of branches and twigs at heights of from 7 to 8 feet from the ground) a good deal of green moss is intermingled with the cocoons in the exterior coating. The nests, too, are somewhat larger, I think, than our northern ones, having internal cavities of fully 2 inches in diameter and 1½ inch in depth.

Mr. J. Davison, C.S., when bird-nesting on the Kondabhari Ghât on the 12th July, writes:—"I also found four nests of *H. azurea*, one with a fresh egg, which I left, and the rest either empty and old or with big young. This bird is very common on this Ghât, and makes its nest generally on an umar tree."

Mr. W. Davison says:—"I found a nest of this bird on the 28th August, 1871, between Goodalore and the Oucherlony Valley. It was an exceedingly neat cup-shaped nest, fastened to one of the sprays of a bamboo that overhung the road; it contained three very young birds."

Dr. Jerdon informs us that "Mr. Ward procured the nest at Honore, in a bamboo-clump, made with bamboo-leaves and fibres, and containing two eggs, white, with a few large blotches of purplish red." There must be some mistake here, as this will not answer either to the nest or eggs of our bird.

Colonel W. V. Legge writes of the breeding of this Flycatcher in Ceylon as follows:—" *H. azurea*, which is an inhabitant of our forests and damp jungle from the sea-level in all parts of the island to an altitude of 4000 feet and more, breeds from April to July. I know of no little bird architect in our province who can excel it in the neatness and finish of its little habitation. A nest I found in a Western Province forest on the 2nd June, 1870, was fixed into the fork of an upright sapling at about 4 feet from the ground, and was made in the shape of a deep cup with an internal diameter of 1½ inch; the materials of which it was constructed were fine strips of thin bark and moss, very neatly woven together, and the rim and exterior were fancifully decorated and bound with

a cocoon-like substance; the lining consisted of fine creeper-tendrils unmixed with any other material. The nest was firmly attached to the two arms of the fork by means of the cobwebs and cocoons used to decorate the exterior surface of the nest. The eggs were two in number, of a buff-white ground, spotted, mostly at the obtuse end, with light sienna-red and a few specks of darker hue. In shape they were round ovals, and measured 0.66 inch in length by 0.54 in diameter."

Mr. Oates, writing from Pegu, says:—"May 28th. Nest with three eggs slightly incubated."

Mr. J. Darling, Jun., writes:—"4th April. Found a nest of *H. azurea*, some 20 miles from Tavoy, in the heavy forest at the foot of Nwalabo hill; it was built in the fork of a small sapling, 5 feet from the ground. Nest built of fibres and moss, plastered with spiders' webs, intertwined with the long feathery substance off the 'mealy bug'; the bottom of the nest was continued down to a point over an inch long. The nest contained three fresh eggs.

"21st April. Took two nests of *H. azurea*, both built in small saplings in jungle with plenty of undergrowth, at heights of 2½ and 3 feet from the ground; east of Tavoy."

A lovely nest of this species, found with three fresh eggs on the 21st April near Tavoy by Mr. Darling, deserves separate description. It is placed between the fork of two upright twigs, each about ¼ of an inch in diameter; it is an extremely regular inverted cone, 3.5 inches in height and 2.25 in diameter at the top, which is the base of the cone. It is composed of fine vegetable fibre closely and carefully wound together, completely enveloping the two twigs between which it is placed; it is then coated with green moss, bound together with cobweb, and dotted all over with tiny white cocoons and scraps of these. The cavity is a deep and perfect cup, 1.9 inches in diameter and 1.5 inches in depth, lined first with very fine grass-stems no thicker than horsehair, and then again very thinly lined with black horsehair.

The eggs of this latter species, which I have myself taken and which I owe to Miss Cockburn of Kotagerry, Mr. F. R. Blewitt, and others, are of much the same type as those of so many of this family. In shape they are moderately broad and very regular ovals, occasionally slightly compressed towards the smaller end; the shell is very fine and smooth, but they have little or no gloss; the ground-colour varies from almost pure white to a pale salmon-pink; the markings consist of specks or spots of red or reddish pink, varying much in intensity, amongst which a few small pale-purple spots are in some eggs intermingled. As a rule, the markings are chiefly about the larger end of the egg, to which in some they are exclusively confined, and where they often form a more or less strongly marked, and more or less confluent zone, or cap, as the case may be. In some the markings are small spots, in others the minutest specks imaginable; and where the markings are pretty dense, as they are in some eggs about the large end, they are commonly more or less enveloped in a reddish halo. The eggs, as will

be readily understood from this description, vary very considerably in appearance, some inclining more to the type of *Terpsiphone paradisi*, others to those of *Stoparola melanops*, but the character of all is the same.

In length they vary from 0·66 to 0·71 inch, and in width from 0·5 to 0·55 inch, but the average of seventeen eggs is a little less than 0·69 inch by a little less than 0·53 inch.

602. *Hypothymis tytléri* (Beavan). *The Andaman Black-naped Flycatcher.*

Myiagra tytléri, Beavan, *Hume, Rough Draft N. & E.* no. 200 bis.

A nest of the Andaman Black-naped Flycatcher was found at Aberdeen, S. Andaman, on the 23rd April, 1873; it was fastened to the branch of a small tree that overhung the path. In shape it is an inverted cone, 3 inches in depth exteriorly and $2\frac{1}{2}$ inches in diameter; the egg-cavity, which is nearly hemispherical, is 2 inches in diameter and 1·1 in depth. The nest is very compactly woven, of soft vegetable fibre, with which also it is firmly bound against the slender stem to which it is attached. Towards the exterior a good deal of green moss, a number of satiny white cocoons, and a little bright ferruginous fern-root have been incorporated in the nest, and the whole carefully coated, though not thickly so, with gossamer threads and spiders' webs, and the cavity of the nest neatly lined with black hair-like moss-roots.

The eggs were three in number, very similar to those of *H. azurea*, but perhaps more strongly marked; in shape they are regular broad ovals; the shell is smooth and fine, and has a faint gloss; the ground-colour varies from pinky to creamy white, and towards the large end there is a broad irregular zone of red or brownish-red specks or spots, in one egg very minute and closely set, in another larger and less numerous, surrounded more or less with a pinkish halo; here and there a few tiny spots or clouds of lilac may be detected amongst the other markings of the zone; outside the zone tiny specks, few and far between, diversify the rest of the surface of the egg.

In length the eggs measured 0·67 and 0·68 inch, and in breadth 0·52 and 0·53 inch.

603. *Chelidorhynx hypoxanthum* (Bl.). *The Yellow-bellied Flycatcher.*

Chelidorhynx hypoxantha (Bl.), *Jerd. B. Ind.* i, p. 455; *Hume, Rough Draft N. & E.* no. 294.

I knew nothing of the breeding of the Yellow-bellied Fantail.

Dr. Jerdon tells us that at Darjeeling he had the nest brought him, but after the young had flown. "It is an exceedingly neat, deep, cup-shaped nest, made of moss, lichen, hairs, and wool, well carded into a compact structure."

Mr. Hodgson figures the nest of this species as a very beautiful, deep, and compact cup, placed on a horizontal fork of a thin branch, composed interiorly of grass-roots closely interwoven, and exteriorly thickly coated with moss and lichens. The egg in the drawing in my possession (which is the original) is represented as nearly white without spots. In the finished copy in the British Museum Mr. Blyth says that the egg is shown as "white faintly speckled."

Mr. R. Thompson, writing from the Kumaon Bhabur, says that this "species breeds in May and June, and builds its cup-shaped, deeply hollow nest on the horizontal branch of a tree, either in a grove, coppice, or damp valley, the bird preferring thick woods to live in. The nest is composed of fine hairs, moss, roots, and plenty of cobwebs, all nicely felted together, forming a neat compact little nest about 2 inches in diameter. I never took down the eggs."

604. *Rhipidura albifrontata*, Frankl. *The White-browed Fantail Flycatcher.*

Leucocerca albifrontata (Frankl.), *Jerd. B. Ind.* i, p. 452; *Hume, Rough Draft N. & E.* no. 202.

The White-browed Fantail Flycatcher breeds all over the plains of Continental India, and in the lower ranges of the Himalayas up to an elevation of at least 4000 feet.

It certainly breeds twice in the year, and if not disturbed rears a second brood in the same nest. Eggs may be found, for I have myself found them, from the latter end of February to the early part of August, but the two chief periods are March and July.

The nests, fully described below, are generally seated on the broad surface of some horizontal bough or else placed on some horizontal slender fork.

The following are some of the many notes I have from time to time recorded about the nidification of this species:—

"*Etawah, 29th of March, 1867.*—Took a nest of this Fantail. It was placed, as they almost always here are, on a mango-tree, resting on the upper surface of a nearly horizontal branch. It was a deep hemispherical cup, with an internal diameter of about 1.75 inch and a depth of about 1.12. It had for internal framework a sort of basket of very fine grass-stems, and was externally everywhere thickly coated with cobwebs; the total thickness of the sides nowhere exceeded $\frac{1}{4}$ inch, but at the bottom, owing to the irregularity of shape of the bough on which it was built, it was in places as much as 0.5 inch thick. It contained three, very similar, slightly incubated eggs. In shape short ovals. The ground white, with many excessively minute yellowish-brown specks, and near the middle towards the large end a pretty broad nearly confluent zone of these specks and faint greyish-brown, or perhaps very pale inky ones, of a rather larger size. The white ground in the neighbourhood of this zone is feebly and partially tinged with buffy."

"April 11th.—Saw a nest of this just ready to lay in. It never appears to lay more than three eggs."

"July 22nd, Agra.—Nest and one egg. The nest was built on the junction of a stout three-pronged branch on which it was firmly seated, having the cobwebs with which, as usual, it was coated, entwined round each of the branches successively. It was found in a mango-tree. The interior of the nest was lined with several pieces of flowering grass. The nest was 2 inches in diameter, 1·37 inch in depth exteriorly, and 1 inch interiorly."

"August 1st.—A beautiful little nest containing three hard-set eggs. The nest was of the usual type, round, cup-shaped, wound round entirely with cobwebs and fastened to a branch of a mango-tree. It was lined with fine grass-roots and a little horsehair."

"July 15th.—Adam found a nest of this species at Muttra in a shrub of *Cerbera thevetia*; it contained three fresh eggs. We have a large series of these now, and altogether they show a sort of family likeness to the eggs of many of the true Shrikes, and especially to those of the pretty little *Lanius vittatus*."

Writing from Bareilly, I said:—"The crow whose eggs we had just taken kept flying about uneasily from tree to tree, when suddenly out darted at it a little bird about one-twentieth of its weight: white below, smoke-coloured above, with a conspicuous white eyebrow plainly visible as it darted after the dusky giant, whose approach it evidently so strongly disapproved. The flight, and the long fan-shaped outspread tail, left no doubt that it was *R. albifrontata*, one of the Fan-tailed Flycatchers. The nest was seated on a horizontal branch of a mango-tree, a very delicate small tumbler-like affair; scarcely $\frac{1}{4}$ inch in thickness anywhere, closely woven of very fine grass, and coated over its whole exterior with cobwebs. The interior diameter was about 1·75 inch, the depth about 1·12 inch. Although the little bird returned and sat across it, its beak and half the head projecting in front, and the whole tail from the vent overhanging behind the nest, the latter contained no eggs."

Mr. F. R. Blewitt, writing of his experiences in Jhansie and Saugor, says:—"Breeds in July and August. I obtained four nests, all on neem trees and firmly attached to the upper surface of a branch where it divided into two slender stems making a fork, on which, in each case, it was placed. The nest is very neatly made; on the exterior composed entirely of vegetable fibre, with a pretty thick coating of some spiderweb-like substance over the vegetable fibre. It is cup-shaped, the lining of it consisting of very fine grass. The outer diameter fairly averages 2·4 inches, inner cavity 2 inches, depth 1 inch."

Mr. R. M. Adam remarks:—"In North Behar I found this bird building on the 21st April. In Oudh I took two nests in May; one contained three, the other two eggs. About Agra I have taken nests in June and July."

Major O. T. Bingham says:—"I found one nest of this bird at Allahabad on the 3rd of July placed on the fork of a mango-tree,

which contained two eggs; and a second nest at Delhi on the 8th July, similar to the former and similarly placed; this also contained two eggs. The nests are neat beautiful little cups, firmly made of very fine grass-roots and unlined; they are plastered, however, on the outside with cobwebs."

Colonel E. A. Butler remarks:—"Several nests, containing three fresh eggs each, in March and April at Hyderabad, Sind, and a nest containing two slightly incubated eggs, 1st July in the same neighbourhood."

Again, from Sind he writes:—"Kurrachee, June 10th, 1877. A nest containing three fresh eggs on one of the small outer branches of a tamarind tree about twelve feet from the ground."

And, detailing his experiences at Deesa, he says:—"I found a nest of the White-browed Fantail at Deesa on the 1st June, 1876, containing one fresh egg. The nest was placed upon a small bough of a *Ficus religiosa* about 20 feet from the ground. The old bird when I visited it the first time seemed quite as fidgetty on the nest as they are when hunting for insects, turning constantly from side to side with outspread tail, often turning a complete circle. Every now and then she would fly off on to a neighbouring bough for a second or two and then return to the nest again. The cock bird is always close at hand, and often utters a few soft sweet notes, which can hardly, however, be called a song. He has also a harsh Shrike-like note, which he utters if a Crow or any other bird approaches the nest, upon which occasions he is quite as pugnacious as a King-Crow, dashing angrily at the intruder without the slightest fear or hesitation, and mobbing him persistently until he leaves the spot. I found another nest on the 18th June in another tree about 10 yards off built by the same pair of birds, containing three much incubated eggs.

"On the 22nd instant I visited the place again and found to my surprise that the same pair of birds had built another nest on a small branch of the same tree within a few feet of the one I had taken on the 18th instant. On the 20th I sent a boy up the tree and found the nest contained three fresh eggs. On the 1st July they built a nest on the stump of the bough broken off with the nest taken on the 18th June, and on the 10th July I took three fresh eggs from it. In a couple of days I visited the place again, and found that they had almost completed another nest (the fifth). I returned on the 19th July, and took three fresh eggs out of it. I visited the place again on the 24th July, and found another nest (the sixth) built on the other side of the tree. On the 26th I went to take it and found three fresh eggs. Strange to say the old birds had built another perfect nest, this time on the same bough about one foot above it, for what reason I do not know, as of course only one (the lower) contained eggs. I visited the place a few days later and saw the two old birds again, but they did not build another nest.

^aOn the 21st July, 1876, a nest containing 3 eggs slightly incubated.

" 29th " " 3 fresh eggs.

" 31st " " 3 fresh eggs."

Lieut. H. E. Barnes informs us that in Rajpootana this Flycatcher "breeds from the latter part of February to the commencement of August, but most nests are found in March and July, and from this I infer that they have two broods in the year."

Messrs. Davidson and Wenden writing of the Deccan say:—"Tolerably common, and breeds."

Captain Hutton tells us that "a beautiful small nest of this bird was taken in the Doon on the 22nd of May; it contained three small eggs of a creamy white, longitudinally dashed with dusky brown or pale sepia. The nest was a very elegant little oval cup, composed of an open basket-work of very fine stalks of plants, and thickly plastered over externally with cotton and the seed-down of plants so as to render the whole compact and strong.

"It ascends as high as 5000 feet in the summer months."

From Murree Colonel C. H. T. Marshall records that "the nest of this Fantail is very neatly made, shallow cup-shaped, carefully covered outside with cobwebs. It is built on a thin branch about ten feet up a tree. The eggs much resemble diminutive Shrike's eggs. Breeds in June."

Dr. Jerdon says:—"I have had the nest brought me, very neatly made with fine roots, lined with hair, deeply cup-shaped, and fixed in the fork of a bamboo. The eggs were white, with some rather large reddish-brown spots."

There is here some mistake; this will not answer at all to the nest and eggs of our bird. Clearly it is the same nest that Ward erroneously took for that of *Hypothymis azurea* as already noticed. I cannot imagine what the bird is to which this nest belonged, and I wish some of my Southern Indian contributors would try and solve the difficulty.

Colonel Legge writes:—"This Flycatcher breeds in Ceylon during the early part of the year. I have not had the good fortune to see its cleverly-constructed little nest myself; but Mr. Jefferies, of Gangawoora Estate, described to me one which was constructed in an orange-tree in his compound at Hindugalla, as being a beautiful little cup-shaped structure placed on a thin branch which oscillated to and fro with the wind, and which the architect, with wonderful skill, had tied to an adjacent branch with a 'stay' consisting of a fine creeper-tendril. This is so extraordinary, that had not my friend been a well-known observer of bird life, and very fond of natural history, I could scarcely have credited the statement."

The eggs are typically moderately broad ovals, a good deal compressed towards one end, and almost invariably exhibit the typical Shrike-like zone. The ground-colour varies from pure white to very pale yellowish brown or dingy cream-colour, and the markings are, as a rule, almost confined to a broad irregular zone, near the large end, of greyish-brown specks and spots of greater or less

intensity of colour, often more or less confluent or connected together by a dull haze of the same shade, and at times intermingled with spots or tiny clouds of very faint inky purple. The upper end of the egg inside of the zone is commonly thinly speckled with spots similar to those composing it. The lower portion of the egg below the zone is as often as not spotless; in other cases it is very thinly speckled like the space inside the zone. In some eggs the markings are absolutely confined to the zone. The eggs are not unlike those of *Culicicapa cinereicapilla*, which, however, are smaller; but they are always more feebly marked than these. In length they vary from 0·6 to 0·76 inch, and in breadth from 0·48 to 0·55 inch; but the average of thirty eggs measured is 0·66 by 0·51 inch.

605. *Rhipidura albicollis* (Vieill.). *The White-throated Fantail Flycatcher.*

Leucocerca fusciventris (Frankl.), *Jerd. B. Ind.* i, p. 451; *Hume, Rough Draft N. & E.* no. 201.

The White-throated Fantail Flycatcher breeds in the wooded Sub-Himalayan tracts and all the warmer valleys of the outer Himalayan ranges (up to an elevation of 4000 or 5000 feet) from Debrooghur to Murrec, in Eastern and Lower Bengal, and in the forest districts of Central India, in Raipoor and the Tributary Mehals, and doubtless throughout Burma.

It lays in May, June, and the early part of July. The nests of this species are typically solid, and compactly built, inverted cones, placed usually in some slender upright fork, which is completely imbedded in the structure of the lower part of the nest; the nests are externally from 3·5 to 4 inches in depth, and from 2·5 to 2·75 in their greatest diameter; they are not, as a rule, true cones, as they generally continue for some distance nearly of the same size, and are then contracted rather rapidly; the rim of the nest is often a good deal higher on one side than on the other; the egg-cavity is about 1·75 inch in diameter, and is from 0·75 to 1·5 inch in depth; the nest is composed of grass-stems, and pieces of dry blades of grass, with here and there pieces of woody and other vegetable fibre, and entirely coated with cobwebs; there is a pretence for lining the cavity with a few fine grass-roots. Occasionally, but rarely, the nests are simply more or less shallow cups, exactly resembling those of *Rhipidura albifrontata*. The eggs are three in number.

Blyth, in Jardine's 'Contributions to Ornithology,' writes:— "The nest of *L. fusciventris* is affixed, sometimes to a small stem of bamboo as represented by our figure in the background, and sometimes placed as represented in our principal figure. It is constructed of, and lined with, fine grass-stems, bound round on the outside with some flat leaves of grass, which are more or less completely covered over with spider's web; and there is always a

quantity of material hanging from the bottom, so as to produce the appearance of a funnel. The peculiarity is much more strongly marked in Mr. Gould's figure of the nest of *Rhipidura albiscapa*; but he says of that species that it has invariably but two eggs, whereas the nest of *L. fuscoventris* here figured contained three. These much resemble the eggs of *Sylvia curruca* (*Curruca garrula*, Brisson), being of a sullied white with few scattered spots, except those forming a broad zone towards the large end, and the colour of which are greenish olive-brown, mingled with some dark ashy spots."

Captain Hutton remarks:—"These curious little Fan-tailed Flycatchers are only seen upon the hills at about 5500 feet in the warmth of summer, and occasionally they breed at that elevation. More generally, however, they are confined to the Dehra Doon, where they frequent the mango trees, darting out occasionally with a tumbling flight as if falling from the tree, and suddenly returning to their perch. It keeps up an almost incessant sharp snapping sound with the beak as it hawks about the tree for insects, and indulges occasionally in a not unpleasing little song.

"Its nest was taken on the 25th of May from a lofty tree, and contained three small eggs of a faint carneau white with a ring of earthy-brown spots at the larger end, and a few of a fainter hue scattered over the shell. Diameter $\frac{1}{8}$ by $\frac{1}{16}$."

"The nest is a very neat and beautifully constructed little cup, being a perfect miniature of that of *Tithorea* (*Terpsiphone*) *paradis*, and composed entirely of very fine grassy fibres compactly held together by a complete and thick coating of cobwebs smoothly plastered all over it. It was placed upon a single twig which ran obliquely from beneath it up one side and formed its sole support. Internal diameter about $1\frac{1}{2}$ inch; over all 2 inches."

Writing from Murree, Colonel C. H. T. Marshall says:—"The nest of this species differs from that of *R. albifrontata*, being the shape of an inverted cone, beautifully made, lined with the finest grass, and covered with cobwebs; it was situated in a clump of thin branches. Eggs like those of *R. albifrontata*, only smaller and rounder. These nests are found in the lower ranges, at about 5000 feet up."

Colonel G. F. L. Marshall writes:—"I found a nest of this species on the 5th June, near Bheem Tal, at about 4500 feet above the sea. It was in a deep shady ravine choked up with brier bushes, the upper branches of which were all green, and the lower boughs shut out from the light were dead and bare. The nest was fixed on to one of the bare dead boughs about three feet from the ground. I had heard the birds singing down the ravine, and creeping under the bushes on my hands and knees to watch them, I came upon the nest; it contained three fresh eggs, and was cone-shaped with the usual tail."

Writing from the Kumaon Bhabur, Mr. R. Thompson says:—"Many nests of this bird I have found, but not in similar localities to those of *R. albifrontata*. The present species prefers deep

dense woods, keeping well within a thickly-wooded forest country, whereas the other prefers more open and cultivated tracts."

From Sikhim Mr. Gammie writes:—"I have only once found a nest of this Fantail. This was in the Cinchona reserves, on the 21st May, at an elevation of 5000 feet, in a bramble thicket on the outskirts of a large forest. It was about five feet from the ground, and attached to a pendent, dead bramble-stem about as thick as a man's thumb, which was quite enveloped by the building material the whole length of the nest. It was an extremely neat and remarkable-looking structure; in form a cup-shaped funnel with the end lengthened out, and composed of fine grasses firmly bound together by cobwebs. The outside was almost completely covered over with cobwebs, which exactly corresponded in colour with the silvery lichens covering the dead bramble-stem, so that anyone might have passed within a yard of the nest without observing it. It measured externally 4 inches in height by 2.3 inches in diameter. The cavity was 1.9 inches wide by 1 inch in depth, and contained three fresh eggs, which is said to be the normal number."

Mr. Benjamin Aitken has the following note on this Flycatcher:—"I have nothing to add to what you already know of the nidification of this species and the preceding one. Both birds are extremely common in Poona, frequenting the gardens and patches of low babool jungle. I have often been struck with their tameness and familiarity, which exceed that of any other bird I know. *R. albifrontata*, I can safely say, is unknown in Bombay, and if *R. albicollis* exists in Akola (Berar), it must be very rare. The latter, however, is quite common in Bombay, and the former tolerably so in Berar.

"I once saw *R. albicollis* collecting cobweb, with which both species seem invariably to cover the exterior of their nests. There was a large spider's web on the ground, and the bird caught a thread in its bill and flew round and round in small circles within a foot of the nest, till a quantity was collected on its bill, but taking the greatest care not to let its wings or tail touch the thread. The Flycatcher then flew off to its nest, and wound the web round it with great rapidity, exactly as you would wind thread on a reel, only that the bird's short neck required it to hop round about the nest, which it always did one way."

Mr. J. R. Cripps, writing from Furreedpore in Eastern Bengal, says:—"A few pairs always seen in the mango topes, in which they delight to remain; is a permanent resident; has a sharp twittering note, very like that of *T. paradisi*, for which I have often mistaken it; is continually snapping its beak and going from branch to branch with a short jerky tumbling flight. I took one nest on the 18th May, 1878, with two fresh eggs; it was attached to one of the outer twigs of a mango-tree which overhung a dry nullah overgrown with cane-jungle, and was about 8 feet off the ground. External diameter 2.16 inches and depth 2; internal diameter 1.75 and depth 0.75. The nest was of the shape of a wine-glass and composed externally of very fine grass and cobwebs,

with a lining of finer grasses; they had broken off the three leaves, leaving the stumps to support the nest."

The eggs of this species are slightly smaller than, but in other respects precisely similar to, those of *R. albifrontata*. In shape the eggs are a somewhat elongated oval, a good deal compressed towards one end. They are wanting in gloss, and have a very pale fawn-colour or yellowish or greyish-white ground, with, usually near the large end, a conspicuous irregular zone of grey specks and spots, a few yellowish or greyish-brown specks being sprinkled over the rest of the egg. Perhaps the zone may be best described as composed of a series of small spots and specks of yellowish brown, intermingled with tiny clouds and spots of purplish grey.

In length the eggs vary from 0·6 to 0·7 inch, and in breadth from 0·48 to 0·52 inch; but the average is 0·65 by 0·49 inch.

607. *Rhipidura pectoralis* (Jerd.). *The White-spotted Fantail Flycatcher.*

Leucocerca pectoralis, *Jerd.*, *Jerd. B. Ind.* i, p. 453; *Hume, Rough Draft N. & E.* no. 293.

The White-spotted Fantail Flycatcher breeds in the western parts of India from Mount Aboo to the Nilghiris. I myself have never taken the eggs or nests of this species, but Miss Cockburn, of Kotagherry, has furnished me with the following interesting account of it and of its nidification:—

"Though not very common on these hills, they are to be found in pairs in certain localities, and their pleasing little song (consisting of several notes which follow each other in a regularly descending scale, like the words 'If it's a pity, to say it; why do you do it?') is frequently repeated.

"These Fantails are most restless and active, constantly flitting from one spray to another, and snapping up small insects while on the wing. When seated on a branch their tails are raised and spread to the full extent, while their wings are lowered and head slightly thrown back. Sometimes they alight on the ground, where it is amusing to watch their activity, which is evinced in a kind of dance (with expanded tails), varied by a snap (like the noise of castanets) aimed at some unfortunate little insect, whose winged progress has suddenly been stopped by the keen-eyed Fantail.

"A pair of these birds are constantly in our garden, and do not show the least degree of shyness or fear, often allowing me to stand and watch them quite close. They build an extremely pretty nest, very much resembling a wine-glass in shape, which, however, appears to be unfinished, and is left with straws hanging down in a careless manner. The upper portion of the nest is entirely composed of very fine straws, with a thin addition of spiders' webs outside, to keep the whole structure firm and also to strengthen its hold on the slender branch to which it is attached. I have sat

for hours watching their untiring industry, and been much amused to see the manner in which the latter part of the building was conducted. One of the birds would fly to the nest with a spider's web in its bill, and, after fixing one end, the little creature, taking hold of the other, would seat itself in the nest and give a sudden twist round and round until it had drawn the material sufficiently tight, when it would fasten it securely, thus giving a neatly finished appearance to the outside. They build on low twigs of large trees, and always lay three eggs of a brownish-white colour, which have a very distinct circle of dark spots and streaks round the thick end. This, however, is the case more or less with all the Flycatchers' eggs with which I am acquainted. These birds have built on the peach-trees in our garden, and, although we were most careful that no one should touch their nests, Squirrels, Crows, and Crow-Pheasants used to deprive them of their young. On these occasions the distress of the parents was sad to witness, but it seemed to last for only a few hours; before the day was ended their sweet song was resumed, and in less than a week another nest would be commenced.

"A pair of these Fantail Flycatchers once had their nest of young ones on an orange-tree, and when my cat went too near it (as they thought) they attacked her in such a manner, fluttering and chattering close to her ears, as to oblige her to take refuge under a wheelbarrow. These birds build in April and the three following months."

Colonel Butler thus describes the nest of this species:—"The nest is one of the neatest little structures I ever saw. It is cup-shaped, with often a long untidy tail in continuation of its base. The interior is composed of fine dry grass compactly woven together, and the exterior is bound with cobwebs, which are wound round it so thickly that from the outside it looks perfectly white. Many of these cobwebs are attached to twigs, to give the nest support. It is generally placed in the fork of one of the small branches of some low thick bush about $2\frac{1}{2}$ or 3 feet from the ground, or on small branches of big trees or low bushes overhanging dry or watery nullahs running through thick jungle or clumps of high trees, in the shade of which these birds are so fond of hunting for insects.

"The dimensions of the nest are as follows:—Diameter, measured across the mouth from the outside, about $2\frac{1}{4}$ inches; depth, measured from the outside and not including the tail, $1\frac{1}{2}$ inch; depth, measured from the inside, $1\frac{1}{2}$ inch.

"The following are some of the dates upon which I found nests at Mount Aboo:—

"April 24th. A nest containing 3 fresh eggs.

" 29th.	"	"	3	"
May 1st.	"	"	3	"
" 2nd.	"	"	3	"
" "	"	"	3	"
" 3rd.	"	"	3	"

other parts of the surface. In some the zone-markings are much feebler and fainter, in others they are comparatively decided.

The eggs vary in length from 0·61 to 0·7 inch, and in breadth : from 0·45 to 0·49.

Family TURDIDÆ.

Subfamily SAXICOLINÆ.

608. *Pratincola caprata* (Linn.). *The Common Pied Bush-Chat.*

Pratincola caprata (L.), *Jerd. B. Ind.* ii, p. 123; *Hume, Rough Draft N. & E.* no. 481.

The Common Pied Bush-Chat breeds throughout the plains country of the continent of India and Burma and in the Himalayas, and ranges running southwards from these up to elevations of from 4000 to 8000 * feet, according to latitude.

The breeding-season is from March to June, and eggs may be found everywhere during this period; but for all that the majority lay in the plains in March and April and in the hills in May.

In the plains perhaps the most favourite site for the nest is in a hole some little way down the side of a well; but any hole almost in the ground will, if sheltered, serve their purpose, and at times, but rarely, they will build in a dense bush or tuft of grass, but still even then on or *close* to the ground.

The nest as a rule is a shallow, somewhat saucer-shaped pad, composed of soft grass, fine roots, and lined with the same, hairs, or other soft material.

I have found them composed entirely of human hair and sheep's wool, fitted together without any attempt at rounding, and I have once or twice taken neat circular nests closely woven of very fine grass and carefully lined with horsehair.

Four is the full complement of eggs; but I have continually found only three more or less incubated ones in a nest, and five are recorded by more than one of my correspondents.

Mr. F. R. Blewitt says:—"This Stone-Chat is somewhat common in the Saugor and Nerbudda and Hoshungabad districts. It is also to be met with in the more open country the whole way from Saugor to Sumbulpoor. I have repeatedly secured its eggs. The nests were always on the ground, of very simple construction, composed of grass-roots externally, and lined with fine grass or a little hair."

* Dr. Stoliczka correctly remarks:—"Common all through the Sutlej Valley up to Nashar, but seldom further east above elevations of 8000 feet."

Captain Hutton tells us that "this little species, which is by no means uncommon in the hills even up to 8000 feet, is also very abundant in the warmer climate of the Dhoon, where it breeds in May and June. On the first of the latter month I obtained a nest containing five eggs of a pale greenish white, thickly spotted with rufous, especially at the larger end, where they become confluent and cloud the shell. One egg was larger and whiter than the rest, the rufous marking of the larger end not being quite so confluent, but forming an ill-defined ring. The nest was placed on the ground at the side of a low bank among grass, and was composed of very fine roots, dead leaves, and grass externally, and lined with black hair of cattle. It was of a rather flat cup-shape."

From Sambhur Mr. R. M. Adam records:—"I found a nest of this bird on the 23rd June, 1873. The nest was in a hole in the bank of an open well. The hole appeared to have been made in the loose sand by the bird, and measured about 3·5 in diameter. The outer lining of the nest consisted of a few pieces of coarse grass, while in the egg-cavity there were a few pieces of fine roots carelessly placed together and not rounded. The nest contained three eggs of a pale greenish colour, with a zone of rust-coloured spots at the broad end, and a few spots and freckles of the same colour on the body of the egg.

"On the 29th June I saw a male bird making a hole with its bill in the bank of an open well; but on visiting it after several days no progress had been made."

From Saharunpoor Colonel G. F. L. Marshall writes:—"The only two nests that I have taken of this bird were structures of a most unique type; they were situated in the middle of tufts of surkery-grass, the insides of which had been all hollowed out, so as to leave a circular space of bare ground in the middle about a foot in diameter, which was sparsely covered over with bits of grass; this circular space was roofed over by drawing the surrounding grass-stems together and weaving in other pieces, so as to form a sort of dome. The interior height of the structure was about 18 inches. The entrance was circular on one side near the top, about 15 inches above the floor of the chamber. The egg-receptacle was a hollow in the floor of the chamber near one side farthest from the entrance and neatly lined with grass, about 2½ inches across and about 1½ inch deep.

"In one nest I found four eggs, slightly set, on the 8th April, and in the other nest were four young ones. This was towards the end of April."

Major C. T. Bingham tells us that this Bush-Chat is "uncommon at Allahabad, common at Delhi, breeds in May and the early part of June in holes in banks lined with grass-roots and a few feathers. Eggs very like those of the Home Stonechat, four in number."

Mr. E. Aitken remarks:—"From the neighbourhood of Bombay this bird retires to the hills to breed. I found a nest at Khanda last year in the middle of May.

"It was in a hole in the perpendicular bank of a railway-

cutting, and of course at the level of the station, which is about 1900 feet, I believe, above the sea. The birds never seem to go much above that, in Khandalla at least. I do not think the hole was excavated by the birds, for I have seen one or two other nests in different situations, such as a small depression or shallow hole, partly covered by a rock. In this case the hole was rather deep, so that I could not see very distinctly into it; but the hole seemed well lined (as it usually is) with grass or fibres, and there seemed to be at least four eggs. In one that I saw two years ago there were four eggs. They can scarcely have more than one brood in the year, for I do not think they begin to breed till May, and they return to the plains before the end of June."

Mr. Benjamin Aitken observes:—"The Pied Bush-Chat does not occur in Bombay, and I have not seen it abundant anywhere on the plains of the Deccan or Berar; but on the hills, from Khandalla (about 2500 feet) to Poorundhur (4472 feet), its name is legion, and there it breeds in the end of April and in May. Its nests are everywhere, but as the bird is as wary as the Lapwing or the Roller, it requires much patience and considerable practice to find one. Personally I only once found as many as five young ones in a nest; but I have twice had seven brought to me by natives, and under circumstances that made it improbable that they had been taken from different nests. I do not know whether many of these birds retire to the hills to breed; but I have seen them commoner at Poorundhur in November than I saw them at any time on the plains."

Mr. H. Wenden writes:—"I only obtained one nest of this bird in Sholapoor, although I had several men out daily to look for more. Very few of this species are seen in that station, but 100 miles south they are very numerous and seem to take the place of the Indian Black Robin; and this may be accounted for by that part of the country being covered with bush and scrub-jungle. The only nest found at Sholapoor was built in a hole in the mud walls of a stable—the hole in which the top bar of a loose box would, when the stall was in use, be inserted. As regards construction, it differed but very slightly from that of *Thamnobia fulicata*, and that only in point of size, being smaller. The nest contained four eggs, three of which I send you."

Colonel E. A. Butler sends me the following note:—

"Belgaum, 1st April, 1880.—Four slightly incubated eggs. The nest was built in the hole of a bank of a ditch 4 feet deep encircling the jail compound, and consisted of a neat little hollow pad of very fine dry grass-stems and roots, scantily lined with horsehair and a tuft or two of rat's fur, probably pulled out of an old dead carcass. The eggs were pale greenish white, spotted all over, but most thickly at the large end, forming a cap or zone, with reddish chestnut. On the same date I found two more nests both similar to the above, one being built in the same bank as the above, the other in the hole of a bank of an open well. Both contained two fresh eggs. One of the nests was composed externally principally

of coarse worsted-like material, collected evidently from some old piece of prison clothing, intermixed with fine dry grass-stems, being substantially lined with black hair, probably human. The other was composed externally of fine dry grass-stems, intermixed with a piece of red dungaree, and lined with black hair, either goat's or human. I left these nests for more eggs, and on returning two days later with my usual luck found both empty and deserted. What it is that takes the eggs of these small birds I can't conceive; but so sure as eggs are left, so sure are they to be taken by whatever it is that robs the nests. On the 3rd inst. I visited no less than four nests, all of which contained eggs when I looked at them on the 1st April, viz. two nests of *Corydalla rufula* and the two Bush-Oats above mentioned, and in all four instances the eggs that I had left but two days before were gone and the nests of course deserted.

"On the 8th April I found another nest in a hole in the bank of the fort ditch containing three fresh eggs, similar to the above, but rather greener, and with a few lilac markings mixed with the chestnut spots at the large end. I shot the hen bird as she left the nest to be sure of the species, and on picking her up discovered another egg in her broken by the shot. The nest was similar to those already described, being warmly lined with horsehair and tufts of rat's fur. Jerdon gives 5 inches as the length of *P. caprata* and 6½ inches for *P. bicolor*, and mentions that he has observed no intermediate form.

"Referring to my measurement-book I find that in all of the specimens I have collected both in Guzerat and in Belgaum the cocks vary from 5¼ to 5¾ inches and the hens from 5½ to 5g inches*.

"Hen birds about Belgaum show signs of a rudimentary white wing-patch,

"I noticed two young birds on the same date being fed by the parent birds on a low bush near the same place; the eggs in this instance must have been laid therefore about the middle of February, as they had evidently left the nest some days. On approaching them the old birds uttered notes of alarm and flew away, and the young ones dived simultaneously into the grass below, to be seen no more, although I searched the spot closely for them for some minutes. The way in which they disappeared like a flash of lightning the moment they heard the alarm-notes of their parents was very remarkable, and the way in which they managed to escape my eye afterwards when I searched the grass for them was more remarkable still. I have often seen a whole brood of dab-chicks (*P. minor*) dive simultaneously with one loud splash on being approached and reappear again gradually one by one until they were all together, and then disappear again with another loud splash on the slightest movement of the person watching them;

* *P. bicolor* does not extend so far north as Belgaum. All the specimens I have examined from this place are *P. caprata*.—Ed.

but have no recollection of seeing birds before of the present family perform such antics. The pair of birds whose nest I robbed on the 1st April in the bank of the jail compound commenced building a new nest a few days afterwards in the same hole, and on the 15th inst. it contained a single egg. On revisiting it on the 17th inst. as usual I found it empty and deserted. On the 18th April I found another nest in a bank surrounding an open field, containing four fresh eggs, and on the 19th another in a hole in the bank of a quarry, containing three slightly incubated eggs. I was surprised in many instances to notice that these birds excavated the holes the nests were built in themselves, instead of using holes already made, of which the banks were usually full. Two more nests on the 4th May containing five fresh and four incubated eggs respectively, and a nest on the 2nd May containing two fresh eggs."

Mr. G. W. Vidal, in his 'List of the Birds of the South Konkan,' remarks of this species:—"Very common inland and under the Ghâts in scrub-clad hill-sides. Less common on the coast. Breeds in April."

From the Deccan Messrs. Davidson and Wenden note:—"Common, and breeds from April to July."

Finally Mr. Oates, writing from Pegu, tells me:—"I have frequently found the nest of this species in Pegu in April and May. It is usually placed in a hole in the ground, the deep footprint of a bullock serving the purpose very frequently; sometimes it is placed on the ground under the shelter of a tuft of grass."

I should note that in some parts of the country, though common enough in the cold weather, it breeds very sparingly. This is the case, for instance, in South Behar and Mirzapore, and even more so, I think, in Lower Bengal. Further detailing information, as to where it does and does not breed freely, is much needed.

The eggs are rather broad ovals, somewhat pointed towards one end and fairly glossy. Somewhat spherical varieties, however, occur. The ground-colour is a delicate pale bluish green, and they are pretty finely speckled, mottled, and streaked with brownish red. The markings are always densest at the large end, where they commonly form a mottled irregular cap, or rarely a zone, while towards the small end they are thin and sometimes altogether wanting. There are two types of marking—the one comparatively streaky and mottly, the other, which is the least common, speckly and spotty. They are not unlike, whether in shape or colouring, the eggs of the English Stonechat, but they are usually considerably smaller, being scarcely, if at all, larger as a rule than those of the Chiffchaff or the Willow-Wren.

They vary, however, enormously in size—in length from 0.6 to 0.77, and in breadth from 0.44 to 0.64; but these extremes represent exceptional eggs, and the majority run near to what I found the average of the fifty eggs measured to be, viz. 0.67 by 0.55.

809. *Pratincola atrata*, Kelaart. *The Southern Pied Bush-Chat.*

Pratincola atrata, Blyth, *Jerd. B. Ind.* ii, p. 124.

Pratincola bicolor (Sykes), *Hume, Rough Draft N. & E.* no. 482.

Specimens of Pied Bush-Chats from the Nilghiris, Pulneys, and other Southern Indian ranges are absolutely identical with others from the hilly portions of Ceylon. Under these circumstances I retain Kelaart's name *atrata*, assigned to the Ceylon bird.

Many naturalists will doubt the propriety of separating specifically the Southern Pied Bush-Chat. The only difference between this and the preceding species is one of size, and had I been able to obtain intermediate sizes I should most certainly not have admitted the distinctness of the two. None of my specimens, however (and they are numerous), seem to show a gradation between the lesser and greater races, and I therefore accept these as distinct.

I have never taken the eggs myself, but many of these, as well as of the nests, have been sent me from time to time by Mr. Carter and other friends from the Nilghiris. All the nests appear to have been taken in holes in banks and walls during March, April, and May. They are all comparatively large, loose, saucer-shaped pads from 4 to 5 inches in diameter and from an inch to 1½ inch in thickness, composed of grass and vegetable fibre, with in some a few dead leaves, in others grass, roots, or a little wool, or a piece or two of rag incorporated into the body of the nest. In some nests there is a regular egg-cavity some 3 inches across and nearly an inch in depth, while in others a very trifling depression towards the centre of the pad serves to contain the eggs. The nests seldom appear to have any regular lining.

Mr. H. B. P. Carter says:—"At Coonoor, on the Nilghiris, I do not think this bird commences to build before the 15th March. On the 18th I found two nests just finished. I constantly found nests with eggs from that time until 22nd April. All the many nests I found were placed in holes in a cutting or slope, generally on the side of the road. They were more or less cup-shaped, and often neatly made, generally of grass and fibres mixed with the fur of hares. One nest I noted as made of grass, a small bit of coir matting, fern-leaves, and down of thistle; no lining. Some are distinctly lined with fur and hairs. I think three is the most usual number, but I have found four eggs in a nest on more than one occasion.

"The male, so far as I could make out, never sat on the nest nor assisted the female during incubation."

Mr. Davison remarks:—"The nest of this bird is certainly the most common on the Nilghiris. It nidificates in holes of banks or old walls. The foundation of the nest is composed of dry leaves, grass, roots, &c. The egg-cavity is usually lined with hair or fur, or, where neither are obtainable, with fine dry grass.

"The eggs vary greatly in coloration. The general type of colouring is a dingy greenish blue, spotted with a dingy brick-red, chiefly at the larger end, where the spots form a zone.

"It is a very familiar little bird, often building its nest in the banks of the busiest thoroughfares of Ootacamund.

"It lays four or five eggs, and sometimes only three."

Mr. Wait tells me that "it breeds pretty well throughout the Nilghiris, at elevations of from 3000 to 7000 feet, at all times from February to July. It builds in holes in banks, and often in drain-holes in walls, 3 or 4 feet from the ground. The nest is cup-shaped, with an internal diameter of from $1\frac{1}{2}$ to 2 inches, composed of root-fibres, grass, weeds, and scraps of woven materials, anything soft, and is more or less lined with very soft fibres or hair. Five, I think, is the regular number of eggs, but they often lay less."

From Kotagherry Miss Cockburn sends me the following note:—

"During the breeding-season the cock is particularly loud in his song, and shows considerably more of his white feathers above his wings (which he has the power of doing) than at any other time of the year. I have often been amused watching a pair from my window when they fancied themselves unobserved. The little brown lady would be busy discussing some large grub tenderly provided for her by her lord and master, while he enlivened the repast by dancing and singing round her on the gravel-walk, at the same time displaying every thread (or, rather, feather) of his snow-white Bishop's Lawn from beneath his little black silk surplice. Their nests are very plentiful in the months of February, March, and April. They generally build in small holes in the banks of roads, and collect a quantity of soft materials, such as wool and down, and usually lay four eggs. However, I once found a nest with six, and watched it with great interest until the young brood were all reared.

"Sometimes they choose curious places to build in. In my vineyard an old basket, bottom upwards, was put aside, and not moved for some little time. One day I noticed a hen Robin fly in and out through a small hole, and on looking in found a nest nearly finished. A few days after it contained four eggs, which in some way disappeared in a short time."

Mr. J. Darling, Jun., remarks:—"This bird breeds very commonly on the Nilghiris from one end to the other. The place selected is usually a hole in a bank; but I have found it building in holes of trees, in the eaves of houses, on the ground in the same place as a Lark, and once in a Swallow's nest. The nest is usually built of leaves and grass-roots and lined with hair, wool, and fur, sometimes feathers. Taking 100 nests found by myself, 70 nests had 4, 10 nests 5, and 20 nests 3 eggs each. I also found 4 nests in the Wynnad with 4 eggs in each. They breed from about the 15th February to the 15th May."

Mr. Rhodes W. Morgan, writing from South India, says:—"It breeds in holes of banks from February to May, laying three or

four pale greenish-blue eggs, minutely speckled with reddish brown, the dots forming a very distinct zone at the larger end. The nest is constructed of moss, pieces of old rag, frayed bits of grass, &c., and is lined with feathers and the dried droppings of the wild cat (*Felis chaus*), which, being principally composed of rat's fur, are very soft; the nest in consequence is often rather odorous. An egg measured .78 inch by .6."

The eggs are typically broad ovals, slightly pointed towards, but somewhat obtuse at, the small end, and with but little gloss; they are, though closely resembling them in character, conspicuously larger and slightly more elongated than those of *P. caprata*. The doubts as to the distinctness of the two species, which must exist, are a good deal weakened by the very marked difference in the size of the eggs—a difference far more apparent to the eye than might be expected from a comparison of their respective linear measurements. The ground-colour is a delicate, very pale, bluish green, and they are more or less thickly freckled, speckled, and streaked with somewhat brownish red. The markings are most dense in all cases towards the large end, where they form in most an ill-defined mottled cap, and in some a broad, conspicuous, though irregular zone. Their style of coloration closely resembles those of the eggs of the Black, Black-eared, Russet, and Pied Wheatears, as figured by Bree; but the ground-colour is far paler and bluer than in his figures, and the markings are brighter and redder. I ought to notice that a faint purple mottling often underlies, or is intermingled with, the red or brownish-red cap or zone. The eggs vary in length from 0.72 to 0.82, and in breadth from 0.53 to 0.63; but the average of forty eggs measured was a trifle less than 0.77 by rather more than 0.6, so that, as a body, the eggs are full one third larger (taking cubic * contents) than those of *P. caprata*.

610. *Pratincola maura* (Pall.). *The Indian Bush-Chat*.

Pratincola indica, Blyth, *Jerd. B. Ind.* ii, p. 124.

Pratincola rubicola (Linn.), *Hume, Rough Draft N. & E.* no. 483.

The Indian Bush-Chat breeds throughout the lower ranges of the Himalayas (south of the first snowy range) at almost any elevation not exceeding 5000 feet, from Afghanistan to Assam. Occasionally, too, they breed in the Salt Range, in the Suleiman Hills, in the plains districts of the Punjab which skirt the bases of these lower hills, and we have one instance on record of the nest being taken at the extreme south of the Saharunpoor district.

All about the valley of the Sutlej below Kotegurh, and again in

* To calculate the actual cubic contents of an egg is a rather complicated problem; but the cubic contents of different sized, similarly shaped eggs are proportional to their lengths multiplied by the squares of their diameters. So, taking the eggs of *P. caprata* as averaging 0.67 by 0.55, and those of *P. bicolor* as averaging 0.77 by 0.6, their respective volumes are as 201 to 277, those of *P. bicolor* being thus more than one third more massive than those of *P. caprata*.

the Valley of the Beas below Bajoura, I have found numbers of their nests, and even in the immediate vicinity of, though at a much lower level than, Simla itself I have seen several.

: April and May seem to be the months in which they mostly lay ; but they have certainly two and possibly three broods, and I have had eggs sent me in from Kotegurh as early as the first week in March and as late as the middle of July.

The situation of the nest varies according to locality. I have found them generally in some low thick bush (generally a thorny one), or dense tuft of grass, on or near the ground. Mr. Brooks, as will be seen, found them mostly in between the crevices of the rough stone walls that support and bound the terraced fields which adorn our hill-sides. I, too, have found a few in such places, in the walls of old deserted cattle-byres, and once in amongst the débris of an old broken and forgotten culvert.

The nest is generally a more or less regular cup, composed exteriorly of rather coarse grass intermingled at times with moss, lined sometimes with fine grass, at others with soft grey fur, the hairs of cattle, a few feathers, and the like. The nests placed in holes in walls are, according to my experience, less regularly and carefully built, and sometimes are mere shapeless pads. The eggs appear to be indifferently four and five ; and though a nest was sent me containing six, I have never seen so large a number in any of the fifty odd nests that I have examined *in situ*.

At Murree, on the west, Colonel C. H. T. Marshall says that the Stone-Chat breeds in numbers in the valleys. Eastwards they seem to be comparatively rare in the breeding-season ; but I have had one nest and eggs sent me from Darjeeling.

Of its nidification at and near Almorah, Mr. Brooks has recorded the following interesting note :—

“At Almorah the young of the first broods were fully fledged by the middle of April. On the hills the cultivated land on the hill-sides is all terraced, and to keep up the earth low retaining walls of dry rubble-stone are built. In course of time these low walls, generally only 3 or 4 feet high, become rather broken and overgrown with grass and plants of different sorts. Sometimes even small thorny shrubs grow from the face of the wall. It is in holes or hollows in these walls that the Stone-Chat delights to build, the situation of the nest being generally near the top of the wall. The nest is always more or less hidden by grass and other plants which grow in all the crevices of these walls. It is generally composed of moss, grass, fibres, and fine roots, and lined with hair and sometimes feathers, in fact just the nest of the English Stone-Chat ; number of eggs five, which in size and colour exactly resemble those of the English bird. In addition to the terraces on hill-sides the bird breeds on open uncultivated hill-sides, where the ground is pretty well overgrown with stunted bushes which resemble the English blackthorn. In these places I never succeeded in finding the nest, for the birds watched me more successfully than I watched them, and found me out whenever I had hidden myself for the

purpose of watching them. I have no doubt, however, that in these sort of places, without broken banks or walls, the situation would be upon the ground at the bottom of a stunted bush a foot or 18 inches high, as in England we find the nest at the bottom of a stunted whin-bush, and rather at one side of the bush, the entrance being from above, *not from the side of the bush*, the latter being the situation sometimes chosen by the Whin-Chat. They lay in Kumaon from the end of March to June."

Colonel G. F. L. Marshall writes:—"I found a single nest of this bird on the 28th May near the village of Jaroundah, on the southern border of the Saharunpoor district. It was in a thick karounda (*Carissa carounda*) bush in a small patch of jungle on the banks of the Kullurpoor branch of the Eastern Jumna Canal. The nest was deeply cup-shaped, made entirely of grass, the coarser bits outside and the finer and softer pieces neatly woven inside. There were two fresh eggs."

Dr. Scully informs us, writing from Nepal, that "two nests of this species were found in the valley in June, placed on the ground and well sheltered by grass and wormwood-bushes."

The eggs of our Indian form are somewhat smaller than those of its English representative. The largest egg that I possess, and I have numbers from Almorah, the Dhoon, and Kotegurh, is smaller than the egg figured by Mr. Hewitson, and several are so much smaller as to be if anything less than his figure of the Clifftchaff's egg. In shape, too, they are possibly somewhat more elongated, being typically I think, to judge from numerous examples, a rather elongated but obtuse-ended oval. In colour and character of markings they are, however, apparently identical, or, if they differ, differ less so even than those of *P. caprata* and *P. atrata*. The ground-colour is dull pale green or greenish white, and they are very finely and faintly freckled with pale brownish red, the markings, which are very delicate, being always most numerous at the large end, to which they are often confined as a feeble cloudy zone or cap, but at times extend over nearly the whole surface.

In length the eggs vary from 0.62 to 0.77, and in breadth from 0.48 to 0.6; but the average of sixty-three eggs measured is 0.7 by 0.55 nearly.

615. *Oreicola ferrea* (Hodgs.). *The Dark-grey Bush-Chat.*

Pratincola ferrea (Hodgs.), *Jerd. B. Ind.* ii, p. 127; *Hume, Rough Draft N. & E.* no. 486.

The Dark-grey Bush-Chat breeds throughout the Himalayas, at any rate from Murree to Bhootan, along the hills south of the first snowy ranges (and in some cases, where these are broken through by large rivers, up the valleys of these latter, far beyond these ranges), at elevations of from 4000 to 8000 feet.

The breeding-season lasts from the commencement of April to the end of July, during which they often, to my certain knowledge,

and very probably always, have two broods, which (if not molested) they rear in the same nest.

The nest is placed on the ground, sometimes under some large overhanging stone or stout earthen clod, inside, or more or less concealed by, a tuft of grass or weeds, sometimes in a little depression in the hill-side under some thick bush, often half under some great bulging root of a forest-tree, and occasionally, but rarely, in some hole in the loose stone-walls that in the hills support and protect our roads. It is a tolerably neat cup-shaped structure, sometimes slight and loosely put together, sometimes comparatively massive and compact, composed chiefly of moderately coarse grass, fine twigs, or moss, and lined either with finer grass-stems, fine roots, horsehair, or soft fur: sometimes a great deal of vegetable fibre and even a little lichen is incorporated in the sides and towards the bottom of the nest. Externally they vary in size from 3.5 to 4.5 in diameter, and from 2 to 3 inches in height. The cavity is about 2.5 in diameter and rarely much more than 1½ inch in depth; very often it is barely an inch. The eggs are four or five in number. I have as often taken five as four, and I have never found less than the latter number when the eggs were deeply set.

From Murree Colonel Marshall and Captain Cock report:—"We took numerous nests of this species between the 1st May and the end of July. They breed in banks. Their eggs resemble those of *P. indica*—pale blue, with a few russet spots at the larger end. We twice found the egg of *Cuculus canorus* in this bird's nest. Elevation 7000 feet."

I have found many nests in Kooloo and in the Valley of the Sutlej and in and about Simla. At the latter station a pair have bred for some seasons close above my house. Of two nests taken, the one near Sultanpoor in Kooloo, the other above Rampoor in the Valley of the Sutlej, I recorded the following note:—

"Nests of this species found, the one on the 17th April under a rock in a dry bank, and another on the side of a bank overhung by a little grass on the 25th May, both at an elevation of about 5000 feet, and both containing five eggs, were rather loosely constructed grass cups, measuring about 4½ inches in diameter and 2½ inches in height. The egg-cavities were about 2½ inches in diameter and 1½ inch in depth. The one was thinly but very neatly lined, chiefly at the bottom of the cavity, with fine white hairs from the fur of some animal. The other had scarcely a trace of this same lining. From their size, and considering the genus to which the bird belongs, the nests were rather massive and compact. I have often seen nests of the same species of much the same materials, but scarcely half the size and not nearly so compact."

At Simla the late Captain Beavan tells us that on the 7th May he shot a female "off the nest, which was carefully concealed in a hole at the root of a tree not far from the house. It is a neat cup, the outside and bottom composed of dry moss, lined inside with horsehair and stems of grass; depth outside 2.5, inside 1.75; diameter inside 2.5, outside 4.25; number of eggs four."

We hear from Captain Hutton from Mussoorie that he "took its nest on the 30th June at about 6000 feet elevation; it was placed on the ground well concealed among short grass on the side of an open hill free from forest. It was a shallow flattish cup in shape, composed of dry grass rather thickly disposed at the sides, and lined with horsehair. Eggs three, of a pale greenish colour minutely speckled with rufous, chiefly so at the larger end. In some there is a faint indication of a ring at the larger end."

Mr. Hodgson's notes contain the following record as to its nidification in Nepal:—

"May 1st, *Jaha Powah*.—Female and nest; nest saucer-shaped, of fine grass and a little moss; no lining; on ground in open field against a small clod, only partially hid by grass; three eggs.

"June 6th.—One nest with male and another with female, both on the ground half under bank of a field; nests of the ordinary shape, of soft dry grass with sparse lining of hair; internal diameter 3 inches, depth less than 1; eggs two in one nest, four in the other. Of the latter nest a *Cuculus canorus* was eating the eggs, and ate two out of the four while watched."

Dr. Scully writes from Nepal:—"A nest of this species, taken on the 14th June, contained three eggs, of which one undoubtedly belonged to a Cuckoo."

Writing from Sikkim Mr. Gammie says:—"I have often found the nest of this species. On the 23rd of last May I found one in a hole in a bank by the roadside; this was above Rishap, at an elevation of about 5000 feet. The nest was a very compact little cup, measured externally 3·75 in diameter and 2·5 in height; internally 2·5 in diameter and 1·5 in depth. Internally it was smoothly lined with black hair; externally composed of fine twigs, fine dry grass, a little moss, and moss-roots. It contained four hard-set eggs."

Occasionally I have seen a nest composed entirely of fine black fibrous rootlets, well felted together and lined with soft brown rootlets, and with a little moss woven into the outer surface on the sides of the cup.

The eggs, although as a body averaging slightly larger, and also, I think, varying less in dimensions, are almost *facsimiles* of those of *Pratincola maura*. They may be, as a whole, somewhat deeper coloured; but I can discover no such difference as would necessitate a separate description of them. In length they vary from 0·68 to 0·76, and in breadth from 0·53 to 0·6; but the average of twenty-one eggs measured (and I much regret that I have measured so few out of the great numbers that I have taken and received) is 0·72 by 0·57 nearly.

618. *Saxicola picata*, Blyth. *The Pied Chat*.

Saxicola picata, *Bl.*, *Jerd. B. Ind.* ii, p. 131; *Hume, Cat.* no. 489.

Professor Valentine Ball thus writes regarding this Chat's habits in the Suliman Hills, west of Dera Ghazi Khan:—"The Pied Stone-Chat was perhaps the most abundant bird which I met with in the

higher regions. A nest which I found in the rocks on the 10th of July at an elevation of 5980 feet contained three very young quite unfledged nestlings, which were probably not a week old. The nest was a very loose structure, the component parts of which (chiefly dried grass) were kept together by their position in a sheltered cleft of rock.

"I noticed that these birds had very much the habits of *Copsychus saularis*. Towards evening they used to come about the bungalow, perching on the verandah, and singing with a low twittering note. Occasionally they would pick up insects off the ground, and sometimes capture them while on the wing."

Lieut. H. H. Barnes, writing from Chaman in Afghanistan, says:—"The Pied Stone-Chat arrives early in March. The first nest was found on the 20th of that month; it was built in a hole in a tree, and was composed of dry grass, lined with feathers, and contained four eggs of a very delicate greenish-blue tint, obsoletely speckled with rusty brown or pale brownish red at the larger end, where the markings form an irregular zone*. A few specks of the same colour are scattered over the rest of the surface of the egg. The average of twelve eggs is .81 by .56."

He subsequently added the following note:—"The Pied Stone-Chat is very common and breeds, arriving at the end of February and leaving in September."

Colonel J. Biddulph remarks regarding this Chat's breeding in Gilgit:—"In the middle of June a nest was found deep in the crevice of a stone wall of a ruined fort. After two eggs had been laid the bird was apparently killed by some animal. One egg was found broken and the ground strewn with feathers of the hen bird. The egg is pale blue, thinly spotted all over with rusty red, more thickly (but not very thickly) at the larger end."

621. *Saxicola pleschenka* (Lepechin). *The Siberian Chat*.

Saxicola hendersoni, Hume; *Hume, Cat.* no. 492 bis.

Colonel J. Biddulph writes:—"I took a nest of this Chat in Astor on the 26th June, at an elevation of 7000 feet, containing five hard-set eggs. It was placed, about a foot deep, in a wall of loose stones supporting a built-up road on the mountain-side, over which was constant traffic. The eggs were very pale blue, with small dusky red freckles thinly scattered over the surface, slightly tending towards a zone at the thicker end, and measured .725 inch in length by .565 in diameter."

Major Wardlaw Ramsay says, writing of this species in Afghanistan:—"The nest is very difficult to find, and I have sat sometimes for half an hour or more hoping that the birds would give some indication of its whereabouts. The only nest secured contained but one egg, of a pale unspotted blue, otherwise like a large Stone-Chat's (*Pratincola maura*) egg. The nest was placed under a collection of small rocks piled up by the torrent in the then dried-

* "I have taken eggs of *Cercomela fusca* at Aboo very similar to these."—H. E. B.

up bed of a mountain-stream. A considerable number of huge stones had to be removed before the nest could be got at" *.

629. *Cercomela fusca* (Blyth). *The Brown Rock-Chat*.

Cercomela fusca (Blyth), *Jerd. B. Ind.* ii, p. 134; *Hume, Rough Draft N. & E.* no. 494.

The Brown Rock-Chat breeds in the northern portions of the Central Provinces, the western and northern districts of the North-western Provinces, and the eastern and central parts of the Punjab and Rajpootana, from about the middle of March to nearly the end of July. It may occur and breed elsewhere, but it is only within these limits that I have any certain knowledge in regard to its nidification.

During the breeding-season it lays regularly twice, at times thrice.

It is a great frequenter of old buildings, and all the grand Mahomedan and Hindoo ruins, forts, and palaces, mosques, and temples afford nesting-sites for one or more pairs of this species. They are tame and fearless. A pair built for years regularly in my house at Etawah, and they often build about native huts. Deep ravines and earthy cliffs also attract them, and thousands of pairs build yearly in that vast network of ravines that fringe the courses of the Jumna and Chambul from opposite Agra to Calpee. Others nest in quarries, and I got several nests from those in the neighbourhood of Futtehpoor Sikri.

Holes in walls, whether mud or stone, and in earthen cliffs and banks, ledges and chinks in rocks and quarries, and the like, are the sites chosen, and in these they build, for the most part, a loose pad-like nest with a feeble central depression, composed of grass stems and roots, the hollow scantily lined with finer roots, horse-hair, and a little wool. Rarely they construct a regular and fairly neat, but still shallow, cup-shaped nest, using the same materials.

Three is the usual complement of eggs, but I have repeatedly (say in five cases out of fifty) taken four.

Major O. T. Bingham writes:—"Very common at Delhi among the ruins around. Breeds from March to August in holes in walls lined with grass and feathers. Eggs usually four in number, pale green, blotched and spotted with reddish."

Writing of his experience in the Saughor, Jhansi, and the Delhi divisions, from all of which localities he sent me eggs, Mr. F. R. Blewitt says that this species "breeds from the middle of May to July. The nest, if it can be so called, I have found in holes of old walls, under ledges of rocks, on the ground, and on one occasion at the base of a thick growing bush. Occasionally, too, it makes its nest in the roofs of outhouses.

* *SAXICOLA ISABELLINA*, *Cretschm.*

The nest of this species has not yet been found in or near India, and the following note by Dr. Scully will be of interest:—"In the neighbourhood of Yarkand it breeds in April and May; three quite young birds were obtained there during the latter month."

"For the construction of the nest roots, grass, khus, feathers, and sometimes horsehair and wool are used, all loosely but thickly packed together, the finer material above. One nest I obtained at the base of a rock was neatly put together. The exterior, an inch or so thick at the base, was formed of roots and coarse grass; the inner cavity cup-shaped, an inch and a half deep, was lined with fine khus and grass. The outer diameter was 5.5, inner 3.

"The eggs are in colour a very light blue-green, with close dark brown spots, sometimes at the upper end coalescing so as to form a well-defined ring. I have never found more than three eggs in a nest, although I am informed that four are sometimes met with in a single nest. The eggs are almost uniform in size; 0.8 in length and 0.6 in breadth may be taken as the average.

"I have seen this bird more frequently on the plains than among rocks and cliffs. It is in its habits free and familiar, much like the Robins."

I notice that out of several scores of nests that I have seen I myself never met with one out in the open built merely at the base of a bush. Such situations for their nests must, I think, be quite exceptional. I quote a couple out of many notes that I have made about this bird's nidification:—

"*March 23rd, Etawah.*—Took a nest of this Chat. The nest contained three eggs slightly incubated. It was a flat pad of fine grass stems and roots, 4 inches in diameter and 1½ inch thick, with a broad shallow depression in the upper surface, which was very scantily lined (a mere pretence for lining) with a little wool and a few horsehairs. It was in a hole of an earthen cliff of a dry nullah, about 9 or 10 feet from the ground and a foot in. The eggs were oval, a good deal narrowed towards the small end, pale blue, with numerous very faint reddish-brown spots and specks, predominating at the large end."

"*March 29th, Ajmere.*—Took a nest in a hole in one of the old walls of the grand Arhai-din-ki-jompri. It was a shallow circular nest about 4 inches in external diameter, chiefly of grass, but with an intermixture of horsehair, thread, sheep's wool, and cotton wool. There were three fresh eggs, rather long ovals, of a delicate pale blue, one almost entirely spotless, the others with numerous reddish-brown specks and spots, in one most numerous over the large end and sparse elsewhere, the other with most of the spots collected into a zone near the little end."

From Sambhur Mr. R. M. Adam tells us that "the Brown Rock-Chat is very common, and is generally seen in pairs about old buildings, near villages, or the loose stony portions of the hills. On the 23rd March I found a nest in the Sambhur fort in a wall of an inner room. It was about 5 feet from the ground. It was cup-shaped, the outside measuring 4½ inches in diameter and the egg-receptacle about 2½ inches. The nest was composed of fine grass, loosely rounded together, and had for a lining a layer of goat's hair worked carelessly round into the shape of the nest. The eggs are blue, with pale, or sometimes dark, reddish-brown spots near the thick end.

"To show how fearless this little bird is, I may mention that in April last one of them built in a hole in a bath-room wall, and did not appear to be frightened by the people going out and in. About three weeks after, when the young had left the nest, the birds laid three eggs in the same nest, and these I took on 10th April, 1873. Later these birds laid a third batch of eggs in the same nest, and these they were allowed to hatch."

Writing from Mount Aboo Colonel E. Butler inquires:—"Have you any instances recorded of *Cercomela fusca* depositing its eggs in the disused nests of other species? I found this bird last month (i. e. in June) sitting upon three eggs in a nest (in a cave) which appeared to me to have belonged to *Cotyle concolor*. It was unmistakably a nest belonging to one of the Swallows—a broad inverted cone built of mud to the side of the cave and lined with dry grass. I have seen many nests of this species this year, but in no other instance have I found the eggs laid in another bird's nest.

"The Brown Rock-Chat breeds at Mount Aboo in February, March, and April. The nest is usually built in holes of rocks, buildings, or stone walls, and when in the former is often supported by a heap of small stones and pellets of dry earth, forming an embankment that extends from 6 to 10 inches beyond the side of the nest, which is evidently intended to make the nest rest horizontally. I have noticed it in so many cases that I look upon it now rather as a rule than as an exception. During the period of incubation both birds are extremely pugnacious, and vigorously attack any small birds, squirrels, rats, lizards, &c. that venture to approach the nest. The eggs, varying in number from three to four, are pale blue, with small dark reddish-brown spots thinly scattered over the whole shell and formed into a narrow circle round the large end."

Lieut. H. E. Barnes informs us that in Rajputana the Brown Rock-Chat breeds from March to the end of July, rearing, he believes, two or three broods in the season.

The eggs are truly *Saxicoline*. In shape moderately broad ovals, generally somewhat pointed towards the small end, and usually with a good deal of gloss. The ground-colour is a most delicate pale pure blue. The markings consist of tiny specks and spots of different shades of red and brownish-red; often very faint, commonly almost exclusively confined to the larger end, but sometimes thinly speckled over the whole surface, and in one egg that I possess forming a broad, irregular, dotted zone round the small end, while the large end is almost entirely free from spots. This latter, however, is quite an abnormal variety. Occasionally the markings are entirely wanting. Considerably elongated examples occur, but as a rule the shape is very uniform.

In length the eggs vary from 0.75 to 0.88 in length, and from 0.58 to 0.65 in breadth; but the average of twenty-four eggs measured is 0.82 by 0.62.

Subfamily RUTICILLINÆ.

630. *Henicurus maculatus*, Vigors. *The Western Spotted Forktail*.

Henicurus maculatus, Vig., *Jerd. B. Ind.* ii, p. 212; *Hume, Rough Draft N. & E.* no. 584.

The Western Spotted Forktail breeds throughout the Himalayas west of Nepal and south of the first snowy range, along the banks of almost every mountain-streamlet, between the elevations of 2000 and 7000 feet or even higher. The breeding-season extends, according to locality and elevation, from the commencement of April until the middle of June.

The nest is almost always placed in close proximity to water, sometimes completely hidden in a rocky niche, sometimes on a bare ledge of rock more or less overhung by drooping ferns, and sometimes on a sloping bank, at the roots of some old tree, in a very forest of club-moss. The nest is cup-shaped, fully 4 inches across and from $2\frac{1}{2}$ to nearly 4 inches in height, the cavity being sometimes shallow, sometimes deep. It is composed of very various materials—moss, moss-roots, horsehair, silky fibre, and the like; but a quantity of dead, more or less skeleton, leaves are always intermingled, and at times form the chief lining, which, however, according to my experience, is more commonly fine rootlets.

Three or four eggs are usually laid; but I have a note of five having once been brought in, all ready to hatch off, by one of my hunters.

Captain Hutton writes from the Dhoon:—"The Spotted Forktail frequents the sides of streams and rivulets, flitting from rock to rock and stone to stone with a light and graceful movement, which is half flight, half hop. Its habits have obtained for it, among the European visitors to the hills, the name of the *Dhobi-bird*, or 'Washerman,' from its loving to frequent the places to which those worthies likewise resort to destroy our clothing. It selects a retired spot along the margin of some quiet streamlet, and there constructs its curious cup-shaped nest upon the ground among the plants and mosses which there abound. The nest is a deep cup, composed exteriorly of fine roots neatly interwoven with horsehair and green mosses, and thickly lined with the gauze-like skeleton leaves of the willows that fringe the margins of the stream; many of these skeleton leaves are likewise interwoven among the external roots. It has a neat and beautiful appearance, in perfect keeping with the trim and dainty plumage of the bird itself.

"A nest taken on the 12th May, at the foot of the hills in the Dhoon, contained three faintly greenish-white eggs, sprinkled over with spots and blotches of rufous or rust-colour. They were hard-set."

From Almorah Mr. Brooks remarks:—"Common in all mountain-streams. Mr. Horne found the nest near Bheem Tal, which was placed in the side of a rocky watercourse, and was a large one composed of moss and fibres. Eggs three or four; ground-colour white, with a faint shade of green, speckled rather sparingly with rusty brown; lays in Kumaon in May."

Captain Cock informs me that this species "breeds in May and June near Dhurmsala and in Cashmere. It makes a large solid nest of moss, placed on a shelf of a bank overhanging a hill-stream, but always well overlapped by the top of the bank, so that the nest is not observable. The nest is large for the bird, of a deep cup-shape, lined with dry leaves and grass-roots. The birds usually lay four eggs, of which there are two distinct types of coloration, or, I should say, of the ground-colour—one having a greenish ground covered with rusty spots, and the other a dirty pink covered with similar spots."

Colonel C. H. T. Marshall writes:—"The Spotted Forktail is common about every stream in Chamba. In April it commences breeding, and does not seem particular as to the elevation at which it builds. I have found a nest in the root of a fallen deodar tree, near where snow was lying in a ravine, about 7000 feet up, and several pairs remain all the summer in their winter-quarters between 2000 and 3000 feet up."

The eggs are oval, in shape resembling those of the Wagtail, but differing from them in the comparative sparseness and clearness of the markings. The ground-colour is generally a pale clear greenish white, rarely a dingy caraneous, and they are thinly spotted, speckled, and even streaked with yellowish or reddish brown. Where several of the spots occur close together, a nimbus of the same colour, but paler, more or less unites them, and a few somewhat faint brownish-purple spots and clouds, or an indistinct mottling of this colour, are here and there occasionally observable. The eggs vary much in size and shape: some are a good deal elongated, and some conspicuously pyriform. They have very little, if any, gloss. In size they vary from 0.9 to 1.03 in length, and from 0.68 to 0.75 in breadth.

631. *Henicurus guttatus*, Gould. *The Eastern Spotted Forktail.*

Enicurus guttatus, Gould, *Hume, Rough Draft N. & E.* no. 584 bis.

When speaking of the previous species, Dr. Jerdon remarks:—"The nest and eggs of this bird have been brought me more than once, made of roots, fibres, and a little moss, with three or four eggs, greenish white, with a few rusty-brown spots."

This, however, as he told me, occurred at Darjeeling, where only the present species, the Eastern Spotted Forktail, and not the preceding one, is found, and his remarks therefore apply to this species.

From Sikhim Mr. Gammie sends me the following:—" *Henicurus guttatus* makes a similar nest to that of *H. schistaceus*,

but a good deal neater. I have found only two nests of it, both unfortunately containing young—one three, the other four; both nests were on tiny ledges of moss-covered rocks, a little above water-mark, in beds of streams. The outer parts of the nests were made flush with the natural moss on the rocks. One had but one skeleton leaf in the bottom, but the other was well lined with them. The eggs, to judge from the broken shells, are very much like those of *H. schistaceus*. It breeds in May and the beginning of June."

Later on, he writes:—"I have seen at least half a score nests of this Forktail, but only three or four with eggs. It breeds in May and June, from 2000 feet upwards. Two of the nests I found had been used at least two years, for their walls were living masses of roots of neighbouring plants and green moss of one or more years' growth. They are usually placed on ledges of rocks by sides of streams, very little above water-mark, and are deep massive structures, round or oval according to the shape of the ledge on which they rest. They are composed of moss intermingled with skeleton leaves, and lined with fine roots. Externally they measure about 6 inches across by 3·5 deep; internally 3·5 inches by 2·5. The eggs are three or four in number."

A recent writer in the 'Asian' remarks:—

"The nest is a rather massive cup-shaped structure, almost entirely composed of moss, lined with a little hair, a few fern-roots, or scraps of the same moss as the whole of the exterior is made of. The base of the nest is nearly always much mixed with damp earth, making the nest very substantial and heavy; one that I had the curiosity to weigh was no less than two and a half pounds. Another effect of the damp earth is to keep the moss beautifully fresh and green, making the nest look much like a clump of growing moss. Jerdon states that the nest is composed of roots, fibres, &c., but I have never come across one so made, though I have taken a great many both of this and other species. It is invariably built near water, and frequently on the banks of some hill-stream, either in a hollow in the bank, amongst or under the rocks, or else under the protecting cover of a stout tree-root, bunch of ferns, or other suitable position; occasionally the nest may be found placed amongst the ferns and fern-moss which grow amongst the rocks at the side of some little-used hill-path, but even then there is sure to be water at no great distance, and the site chosen will be a damp one. I found one nest placed in a hollow in a wall of rock forming a part of one side of a big hill-stream. The hollow was nearly filled with moss, and it made a peculiarly comfortable abode, and, moreover, a very safe one, as, though quite visible from the low bank opposite, it could only be got by means of a boat or raft.

"The eggs are either three or four in number; sometimes, though but rarely, they are as many as five. They are of a very pale greenish-white ground-colour, freckled throughout with pale reddish; the amount of spots and the depth of their colour varies greatly in different specimens, sometimes they are quite profusely covered with dark reddish, and at other times almost unspotted,

such freckles as there are being entirely confined to the larger end. The most common type, however, will be found to be that first mentioned.

"They breed from May to July, commencing to lay at the end of the first month. I had a Forktail's nest with eggs, four hard-set, brought to me once in August, which may have belonged either to this species or to *H. schistaceus*, the eggs of which differ but slightly from those of *H. immaculatus*."

A lovely nest of this species sent me from Sikkim, taken near Mongphoo on the 6th May, at an elevation of 3000 feet, and which contained four fresh eggs when taken, is a massive cup of green moss firmly felted together, lined with fine fern-roots, and then the cavity completely coated inside with skeleton leaves. Exteriously the nest is about 5 inches in diameter and 3 in height; the cavity is 3 inches in diameter and 2 in depth.

Eggs of this species, with which I have been favoured by Mr. Gammie, belong to quite the same types as those of its congeners. The eggs are somewhat elongated ovals, typically pointed towards the small end, but more or less pyriform and obtuse-ended varieties occur. The shell is fine and compact, but it never has much gloss, and in some specimens scarcely any. The ground-colour varies, sometimes nearly pure white, sometimes greenish white, and sometimes a pinky or creamy stone-colour. The markings consist of freckling and mottling of different shades of reddish, purplish, or yellowish brown, the shade varying in every egg, often densest about the large end, and often more or less sparse over the rest of the egg. In some eggs small spots and specks of more pronounced colour, olive or reddish brown, are dotted about amongst the mottlings, and in some eggs there is a little faint purple or lilac mottling intermingled at the large end.

In length the eggs vary from 0.86 to 1.0 inch, and in breadth from 0.65 to 0.7 inch.

632. *Henicurus schistaceus*, Hodgs. *The Slaty-backed Forktail*.

Enicurus schistaceus, Hodgs., *Jerd. B. Ind.* ii, p. 214; *Hume, Rough Draft N. & E.* no. 588.

The Slaty-backed Forktail breeds in the valleys of the Surjoo and Ramgunga in Kumaon, near the junction of which I obtained the nest with half-fledged young in July, and thence eastwards in all the warmer mountain-valleys, at elevations of from 1500 to 3500 feet, throughout the Himalayas and the various chains and hill-systems running down from Assam to Burma.

As far as I know, Mr. Gammie was the first oologist who obtained the eggs. He says:—"I found one nest this year in the Ryang, below our chinchona-plantation (Sikkim), at an elevation of about 2000 feet, on the 4th May. It was close to the ground, on a natural ledge in the root of an uprooted tree, at the edge of a shady stream. It was cup-shaped but shallow, and composed of

moss and lined with a few skeleton leaves and a few fibres. It measured 4·5 in diameter and 2 inches in height externally; the cavity was 3·1 inches wide and 1·5 deep. This nest contained four hard-set eggs."

Another nest of this species was sent me from Native Sikhim, where it was found in July, at an elevation of about 5000 feet, in the hollow of a rock on the bank of a mountain-torrent.

The nest was a small shallow cup, about 4 inches in diameter, composed externally of fine dry moss and a few blades of dead grass, and with a quantity of skeleton leaves incorporated in the substance of the nest, and more or less forming its inner surface, for it cannot be said to have had any regular lining. It contained a single perfectly fresh egg.

Major C. T. Bingham, writing from Tenasserim, says:—"Toiling along the steep ascents and descents on the road from Kaukarit to Meeawuddy, on the Thoungyeen river, on the 1st March, I came to a small stream, rocky and covered with boulders. As I wished to get a few Forktails for my collection, I approached cautiously. On the left I could see nothing. On the right—yes, there, hopping out from under a fallen log, was a specimen of *H. schistaceus*. Next moment I had rolled it over, and secured the body as it came floating down the stream. With some trouble I worked my way up to the fallen tree, and after a good hunt succeeded in finding the nest, beautifully concealed in a crevice between the roots on the underside of the tree. Nest made of moss felted together into a cup about 2 inches deep and the same in diameter, lined with the skeletons of peepul leaves, and containing three slightly-set bluntish oval eggs, pure dead white, sparsely speckled and spotted, chiefly at the larger end, with pale brown.

"On the 13th March, lower down in the valley of the Meplay river, a feeder of the Thoungyeen, I found a second nest, similarly wedged into the crevices of the roots of a fallen tree, in a little rocky stream. Nest, not two pins different to the last one, contained three unfledged young ones. Two of the eggs taken as above described measured $0\cdot87 \times 0\cdot62$ and $0\cdot85 \times 0\cdot63$ inch respectively."

Mr. J. Darling, Jun., also records the finding of the following nests in Tenasserim:—

"On the 8th April I shot a female *H. schistaceus*, and on the 10th in the same spot a male, which had been with the hen, and which was flitting about with an insect in its bill. On the 12th, passing the same spot, I noticed a young one, half-fledged, lying on the ground dead, and saw it had fallen out of its nest. This was built in a hole of a tree overhanging a stream, 5 feet from the ground, and was constructed entirely of moss: a good large nest, and lined with dry thin leaves; the cavity was $2\frac{1}{2}$ inches in diameter and 2 inches deep.

"On the same day I found an exactly similar nest, built on a ledge of rock on the bank of a stream. These two nests were

found at the foot of Nwalabo mountain, in heavy forest, some 35 miles in an easterly direction from Tavoy."

The eggs are very regular ovals, only just a little compressed and pointed towards one end. The shell is very fine and fragile, and has a fair amount of gloss.

The ground-colour is white, with the faintest possible greenish tinge, not noticeable until the egg is placed alongside of some other really pure snow-white egg; as for markings, there is at the large end a small cap composed of densely-crowded specks and spots of brownish red or dingy pale raw sienna of varying shades and intensity, and a few specks of the same scattered over the rest of the egg, nowhere numerous, but much more sparse towards the small end, where they are in some eggs absolutely wanting. In amongst the markings of the cap a few pale reddish or lilac-purple clouds, as a rule faint and dull, underlie the more conspicuous brownish-red specklings.

All the eggs are very similar in appearance and uniform in size, and they only vary in length from 0·84 to 0·87 inch, and in breadth from 0·63 to 0·67.

633. *Enicurus immaculatus*, Hodgk. *The Black-backed Forktail.*

Enicurus immaculatus, Hodgk., *Jerd. B. Ind.* ii, p. 213; *Hume, Cat.* no. 585.

A note I have on the nidification of this Forktail was sent me by Mr. Oates, who writes:—"I found the nest, with three fresh eggs, on the 20th April, in a nullah on the eastern side of the Pegu hills."

A writer in the 'Asian' remarks:—

"The nest is like that of *H. maculatus*, but the eggs are much smaller and are profusely marked throughout with dark reddish.

"In this, as in the other Forktails, the tail of both sexes becomes much frayed whilst the incubation of their eggs is in progress.

"It is much rarer than either of the two birds already mentioned, and keeps to small streams and paths in dense evergreen forests. The usual note is rather softer than is the case with the other birds of this genus."

637. *Microdichla scouleri* (Vigors). *The Little Forktail.*

Enicurus scouleri, Vigors, *Jerd. B. Ind.* ii, p. 214; *Hume, Rough Draft N. & E.* no. 587.

Enicurus nigrifrons, Hodgk., *Jerd. B. Ind.* ii, p. 215.

The only note that I have as yet received in regard to the nidification of the Little Forktail is from Mr. Brooke. He says:—"I noticed a pair of these birds between Batwari and Dungulla, which appeared to have their nest in a very peculiar situation.

This was on the 11th May. In the middle of the foaming torrent of the Bhagiruttee was a large rock, over which the water rushed furiously in the form of a cascade. Through this cascade the birds dived or darted numbers of times, with either food or nest-materials in their bills. They generally remained some minutes within the water, and from their attachment to the spot they evidently had their nest there. The place was perfectly inaccessible, and however the little birds managed to get through the sheet of rushing broken water without being swept away I do not know."

Dr. Jerdon writes:—"A nest was brought to me, said to be that of this bird, found on a ledge of rock near a stream, with three eggs, very similar to those of *E. maculatus*, but smaller."

638. *Chimarrhornis leucocephalus* (Vigors). *The White-capped Redstart.*

Chæmorrornis leucocephala (Vig.), *Jerd. B. Ind.* ii, p. 143; *Hume, Cat.* no. 506.

The late Mr. A. Anderson, when on a trip through Kumaon, found the nest of this species. He writes:—"Whilst at Furkia I was so fortunate as to fall in with two nests of *Chaimarrornis leucocephala* and one of *Ruticilla fuliginosa*, which may just as well be included in the present notice, the more so, as I can find no allusion to the nidification of the former in any of the ornithological works to which I have access.

"I do not know of any better instance of the importance of oology as an element in the classification of birds than the eggs of these two species, and, I might almost add, of *Enicurus maculatus*. Alike in their habits, the situations they frequent, and the style of nest architecture, the perfect similarity in the coloration of the eggs of these two species of Redstarts indicates a close alliance with each other.

"Both nests of the White-capped Redstart were taken by myself on the 20th of May, from a high precipitous moss-covered bank which overlooked the boiling rapid (Pindar), very much to the horror of my *quasi*-shikaree 'Kheima,' who professed to be my guide and keeper, but in reality was the most arrant humbug I ever met. The nest of this bird is very like that of the European Robin, and is composed outwardly of green moss roots and fibres, the egg-cavity being profusely lined with goat's hair; its natural position is in a hollow of a bank on the side of a stream, the entrance being sheltered by overgrowing moss and ferns.

"The eggs are three in number (I allowed ample time for a fourth to be laid); and as they are so very like giant specimens of the eggs of *Ruticilla fuliginosa*, as described by Captain Cock and Mr. Brooke, and the exact counterpart of those taken by myself, any further description is almost superfluous. The ground-colour of both sets is greenish white, profusely covered with rufous or reddish-brown spots; the markings in one clutch have a tendency

to become confluent at the larger end, somewhat in the form of an irregular cap; in the other the spots and blotches are larger and more equally diffused throughout the surface."

639. *Ruticilla frontalis* (Vigors). *The Blue-fronted Redstart.*

Ruticilla frontalis (Vig.), *Jerd. B. Ind.* ii, p. 141; *Hume, Cat.* no. 503.

Mandelli's native collectors brought 13 eggs, probably belonging to this species, from Native Sikkim, where they were found during the latter part of June. Many of the smaller birds and eggs they brought with them were sadly mixed together and they could not point out the parent bird of these eggs with certainty; the eggs are no doubt those of a *Ruticilla* and the only bird of this genus they brought was a *R. frontalis*; whether all the eggs belong to this species or to some other *Ruticilla* besides, it is of course impossible to say.

The eggs are somewhat elongated ovals, more or less conspicuously pointed towards the smaller end and are sometimes pyriformed. The shell is extremely fine and delicate and sometimes has but little, at others a fair amount of gloss. The colour is an extremely beautiful uniform pale slightly greenish blue; they vary in length from 0.75 to 0.86, in breadth from 0.58 to 0.62, but the average is 0.82 by 0.59.

644. *Ruticilla rufiventris* (Vieill.). *The Indian Redstart.*

Ruticilla rufiventris (V.), *Jerd. B. Ind.* ii, p. 187; *Hume, Rough Draft N. & E.* no. 497.

Dr. Stoliczka told me that he saw four eggs of this species at the camping ground of Lama Yuroo, in the valley of the Tsarap in Rupshu, at an elevation of about 13,000 feet. They were a little larger, and their uniform sky-blue colour was a little paler than that of the eggs of the common European Redstart.

I may notice that the bird is absolutely a winter and spring visitant only to the plains, and that in the following account Colonel Sykes must have made some mistake. He says:—"Has a peculiar manner of vibrating its tail when seated on a bough. A pair of these birds built their nest in an out-house constantly frequented by my servants and within reach of the hand" (*Sykes, P. Z. S.* 1832, p. 92). It is absolutely certain, in my opinion, that this bird never breeds in the plains of India*.

Major Wardlaw Ramsay says, writing of Afghanistan:—"At 12,500 feet on the Safed Koh, on the 1st of July, I observed a pair

* But birds of this species are certainly met with in the plains in summer and cannot be very rare. There are three in the Hume Collection shot at Sambhur by Mr. Adam in July and one procured at Ahmednugger by Dr. Fairbank in June.—Ed.

of Redstarts hanging about an old tree-stump; I shot the male, and on searching the stump found the nest in a crevice; but, unfortunately, it contained no eggs. The nest had the appearance of having been used; so that it is possible that the young had flown."

Colonel J. Biddulph remarks:—"These birds go beyond Gilgit to breed as a rule; one female was shot off the nest with young at 10,000 feet elevation in the Gilgit district;" and he subsequently added "I procured a specimen as late as the 27th November. It apparently breeds on the Shandur plateau, whence I received an immature specimen in August."

646. *Rhyacornis fuliginosus* (Vigors). *The Plumbeous Redstart.*

Ruticilla fuliginosa (Vig.), *Jerd. B. Ind.* ii, p. 142.

Nymphæus fuliginosus (Vig.), *Hume, Rough Draft N. & E.* no. 505.

I have never myself taken the nest of this species, but I have had it brought me by my collectors.

The birds breed in May and June (apparently at all elevations in the Himalayas from 5000 to 13,000 feet), laying three, four, and even five eggs, generally in the immediate vicinity of running water. One nest found in a hole in a rock was composed of fine grass and moss-roots with a little moss—a very slight nest, little more than a lining to the hole. Another was described as far more substantial, planted in a niche of a rock with some few dry leaves and much moss intermingled in the structure.

Writing from Dhurmsala Captain Cock remarked that "the so-called Water Robin nidificates in May and June in the North-west Himalayas. The nest is composed of moss, mixed with a little dried fibre and lined with white goat's hair; it is cup-shaped and rather deep; inner diameter of cup $2\frac{1}{2}$ inches. The nest is generally placed on a shelf of rock, where it is protected from the rain and out of the reach of animals. It is always by the side of a hill-stream. I have found two nests close together within 2 yards of each other. They lay four eggs, greenish-white, covered with rusty freckles.

"The eggs do not vary much either in size or colour."

Writing from the hills north of Mussoorie, Mr. Brooks says:—"I found two nests between Batwari and Dangulla on the 11th May: one contained fresh eggs, and the other eggs deeply incubated. The situation of both nests was the same, viz., in the crest on top of the small steep bank formed by the excavation for the road on the hill-side above the river. The top edge of the excavation was about 7 or 8 feet above the footpath, and the nests were placed in small shallow holes or cavities and overhung by tufts of grass. They were composed of moss, fine roots, and fibres, and lined with hair and wool. The number of eggs was five, and they measured from 0.73 to 0.76 long, by 0.6 broad; 0.76 was, however, the average length, and only one was so short as 0.73.

"The eggs of one set were of a greenish-white ground-colour, profusely mottled and spotted all over, almost hiding the ground-

colour, with pale reddish brown, the markings being denser towards the larger end of the egg. This I take to be the typical coloration of the egg. The other set of eggs were of the same ground-colour, but the spots and blotches were larger and more open and distinct, allowing considerable portions of the ground-colour to be seen. Towards the large end the spots somewhat coalesced in the form of a zone, and at this part of the egg they were mixed with other spots of a reddish grey. This latter set of eggs much resembled the better marked ones of *Pratincola caprata*.

"One nest was about 50 feet above the water-level of the river, while the other was fully 100 feet. This bird was tolerably abundant along the course of the Bhagiruttee from Batwari to above Deralee; and so was *Chamarrhornis leucocephala*; but although I spent much time in watching the old birds, I never succeeded in finding the eggs of the latter, so very careful is it not to disclose the whereabouts of its nest."

Dr. Stoliczka remarks that he "found it breeding near Losar, in the Spiti Valley, at an elevation of 13,000 feet. It lives here during the summer, but migrates to the lower hills about October, when the young birds are full-grown."

A lovely nest of this species taken by Mr. Gammie at an elevation of 4000 feet near Rungbee, in Sikhim, on the 17th April contained three hard-set eggs. It was, for the size of the bird, a massive nest composed entirely of moss and moss-roots finely felted together and sparingly lined with silky vegetable fibre, extremely fine, some of it white and some red. The nest was 5.5 in diameter and 3 inches in height exteriorly, the cavity 2.5 in diameter by 1.25 in depth.

Canon Tristram remarks that the eggs of *Ruticilla* are never spotted, though the ground-colour varies from pure white (in the single instance of *R. tithys*) to the most delicate white with a faint bluish tinge (in *R. moussieri*) up to the very dark blue of *R. semirufa*. If this generalization be correct, it constitutes another proof that the present species cannot be classed as a *Ruticilla*; indeed, in its habits it most closely approaches the Forktails, especially *Henicurus scouleri*, in whose company it is so commonly found, and its eggs are not unlike, so far as coloration is concerned, many varieties of those of *Motacilla maderaspatana*.

As regards character and colour of markings, and even as to shape (though those of the present species are considerably smaller), Mr. Hewitson's figure of the egg of *Calandrella brachydactyla* faithfully represents the most typical form of the Plumbeous Redstart's eggs.

More or less broad ovals in shape, somewhat pointed or compressed towards the small end, the faintly greenish-white ground is almost entirely obscured in most specimens by a dense mottling and freckling of somewhat pale and dingy yellowish or reddish brown. Except for the faint tinge of green in the little of the ground-colour that appears, some of these eggs are very similar to those of several species of our Indian Larks, unless indeed a somewhat

greater fineness of texture and glossiness of surface help to separate them. Abnormal as they may appear for a bird hitherto classed as a Redstart, such are truly the eggs of the present species. I may add that the colouring of these eggs somewhat recalls that of those of the sub-Alpine and Sardinian Warblers as figured by Mr. Bree. In some eggs the markings are much redder, and these eggs of course approach nearer to those of the Common Robin. They are, however, always browner, more dingy, and smaller than the eggs of this latter bird. The markings have a strong tendency to become confluent at the large end, where they are always most dense, and often exhibit a strongly marked but mottled and irregular cap. The eggs vary from 0·7 to 0·8 in length, and from 0·56 to 0·64 in breadth: but the average of eighteen eggs is 0·76 nearly by 0·6.

651. *Calliope pectoralis*, Gould. *The Himalayan Ruby-Throat*.

Calliope pectoralis, Gould, *Jerd. B. Ind.* ii, p. 150; *Hume, Rough Draft N. & E.* no. 513.

Of the nidification of the Himalayan Ruby-Throat nothing very authentic is known. A nest, said to belong to this species, was sent me from Native Sikhim, where it was found in June in a deep crevice in a rock, at an elevation of about 12,000 feet. The nest is only a warm saucer-shaped pad of *very* fine moss and fern-roots closely felted together.

The eggs, of which it contained two, are regular ovals, slightly compressed towards the small end. The shell is fine, but exhibits scarcely any gloss. In colour the eggs are a uniform pale salmon-buff.

As these were brought in by native collectors, much reliance cannot be placed on them. At the same time all the eggs brought in by the same men with which we were previously acquainted were correct, and it is quite as likely as not that these may be so also, though Pallas says that those of the nearly-allied *C. camtschatkensis* are greenish.

The eggs measure 0·9 and 0·91 in length, and 0·67 and 0·66 in breadth respectively.

Mr. Brooks remarks:—"Found beyond the Pir Panjal Pass, frequenting large beds of broken rock on the grassy hill-sides where they breed. The song is pretty and *Accentor*-like."

Colonel J. Biddulph writes from Gilgit:—"First seen on May 1, by which time it was in full breeding-plumage. It breeds at 10,000 feet. Evidently two broods are produced in the year."

653. *Tarsiger chrysæus*, Hodg. *The Golden Wood-Chat*.

Tarsiger chrysæus, Hodg., *Jerd. B. Ind.* ii, p. 149; *Hume, Rough Draft N. & E.* no. 511.

The Golden Wood-Chat, according to Mr. Hodgson's notes, breeds in the central regions of the mountains of Nepal, and is

shy, solitary, and bush-loving. It lays from three to four eggs, a pale verditer-blue; regular oval eggs about 0·72 by 0·5; and makes its nest on the ground, in holes of rocks or banks, or at the base of some decaying tree. The nest is a compact saucer, composed of moss and moss-roots, and lined with sheep's wool and a few soft feathers. One nest obtained in August measured 4·62 in diameter, and 1·87 in height externally; the cavity measured 2·75 in diameter and 1·12 in depth. This species apparently breeds from May to August.

Two eggs, said to belong to this species, were procured in Native Sikhim together with one of the parent birds, in June. In shape these eggs are very regular ovals, a little pointed towards both ends; the surface of the shell is rather uneven, but there is a fair amount of gloss on them; the colour is a uniform rather deep blue. They measure 0·81 by 0·58 and 0·80 by 0·57.

654. *Ianthia rufilata* (Hodgs.). *The Red-flanked Wood-Chat.*

Ianthia cyanura (Pall.), *Jerd. B. Ind.* ii, p. 146.

Nemura rufilata, *Hodgs., Hume, Rough Draft N. & E.* no. 538.

I have never succeeded in finding a nest of the Red-flanked Wood-Chat. In the hills north of Simla they breed, I believe, very high up. Writing of the Sutlej Valley, my friend Dr. Stoliczka says:—"This species does not occur in summer to the west of Nachar and not below 8000 feet. It breeds near Chini, and even here almost only near the limit of trees, at about 12,000 feet. It is often seen about Korzog in Rupshu, at an elevation of between 15,000 and 16,000 feet."

But further west in Cashmere they breed as low as 6000 feet, and I have eggs taken there during the latter half of May and the first half of June. They breed there, it appears, in holes, making a nest of moss and grass lined with soft white grass.

From Cashmere Mr. Brooks noted that "this bird, like *Siphia leucomelanura*, breeds in the immature or female dress. I shot several pairs which were nesting, and saw others. Only one pair had the male mature, and differing from the female. It nests in holes in bank-sides, under tree-roots, or fallen tree-trunks. The eggs, four in number, are bluish white, very faintly marked towards the larger end with the palest reddish brown. Those markings can only be seen upon a close inspection. Length 0·74 by 0·56."

He obtained, if I remember right, only a single nest, and this was at Goolmergh, and on the 2nd June. Each of the three nests of which I have notes contained four eggs.

Mr. Brooks mentioned in *epist.*: "The shape of the egg is similar to that of other Robins, but diminishes rather more rapidly from the centre of the egg towards each end. The texture is smooth with a slight gloss; ground-colour pale greenish white, with some indistinct faint mottlings of very pale red at the larger end with a tendency to form a zone."

The eggs of this species are broad ovals, much compressed and pointed towards the small end, and at times somewhat pointed even towards the large end. They are white with a delicate green tinge, and towards the large end exhibit a faint zone of the most minute reddish-brown specks conceivable. The shell is very smooth and compact, has always a certain amount of gloss, which in some cases is very bright and decided. In length they vary from 0.69 to 0.74, and in breadth from 0.54 to 0.58; but the average of twelve is 0.71 by 0.56.

657. *Adelura caeruleicephala* (Vigors). *The Blue-headed Wool-Chat.*

Ruticilla caeruleocephala (Vig.), *Jerd. B. Ind.* ii, p. 141; *Hume, Rough Draft N. & E.* no. 504.

This species, which is very common about Simla in the winter, making its appearance there with *R. frontalis* about the middle of November, retreats, like this latter bird, during March to higher regions, where it may be found throughout the summer at elevations of from 10,000 to 13,000 feet, amongst other localities in the snow-capped hills that bound Spiti on the south and west, and divide it from the valleys of the Sutlej and the Beas.

The only nest we ever got was placed in a cleft of a rock on the path leading up the Humpta Pass immediately above Juggutsook, at an elevation (as nearly as might be guessed with reference to that of Juggutsook and the top of the pass) of only 11,000 feet. It was a triangular-shaped pad, accommodated to the shape of the crevice, some 4 inches each way, composed chiefly of moss, but with some grass and fir-needles intermingled, and with a shallow central depression lined thinly with soft grey fur-hairs, probably of hares: this was on the 16th April. The nest contained one single fresh egg, a very regular and perfect oval. In colour a uniform pale delicate blue, fairly glossy, and measuring 0.83 by 0.62. The mouth of the crevice, which was about 9 inches deep, was partly curtained by delicate drooping herbage, and we should never have noticed it if the two parents had not suddenly darted out of it when we were actually abreast of it. Unfortunately we shot neither, but I have no earthly doubt myself of what they were. I may add that a second egg said to belong to this species, and to have been taken on some of the hills overlooking and north of the Wangtoo Bridge, has since been sent me. It is precisely similar, but measures 0.85 by 0.63.

It is just possible that we have made some mistake about the eggs of this species, for Major Wardlaw Ramsay gives a very different description of them. Writing from Afghanistan he says: "It breeds in May and June. On the 22nd of May I found a nest in a crevice in the face of a precipitous cliff in a deep mountain-gorge. It was composed of small twigs and dried grass, thickly lined with camels' hair. I shot the female as she left the

nest, which contained five fresh eggs of a dull cream-colour, with a broad zone of the same colour, but darker near the thicker end."

Colonel J. Biddulph informs us that in Gilgit this species is "a summer visitor. It appears in April and breeds at about 10,000 feet."

659. *Notodola leucura* (Hodgs.). *The White-tailed Blue Robin.*

Myiomela leucura (Hodgs.), *Jerd. B. Ind.* ii, p. 118.

Notodola leucura (Hodgs.), *Hume, Rough Draft N. & E.* no. 477.

The White-tailed Blue Robin, according to Mr. Hodgson's notes, breeds in the central regions of Nepal, amongst brushwood or low jungle, during the months of April and May. The nest is generally placed on some ledge of rock, more or less sheltered by grass or bushes, and is a deep massive cup composed of mosses and moss-roots. Four eggs are said to be laid, and these are figured as moderately broad ovals much pointed towards one end, measuring 0.9 by 0.65 inch, and of a uniform mottled or curdled pinkish-clay colour.

Dr. Jerdon tells us that at Darjeeling the Lepchas brought him a nest and eggs, alleged to belong to this bird, exactly resembling those of *Niltava sundara*.

I have never taken the nest myself, but I have little doubt that the Lepchas were correct. A nest of this species, containing two fresh eggs, was taken by Mr. Gammie at Rishap, near Darjeeling, at an elevation of about 4000 feet, on the 14th May. It is a large somewhat shallow cup, about 5 inches in external diameter and 2 inches in height, composed externally chiefly of dead leaves and dry grass, but internally of the finest possible moss-roots compactly fitted together. A good deal of green moss is incorporated in the body of the nest, and shows out here and there amongst the dead leaves with which it is almost entirely coated.

From Sikhim Mr. Gammie now writes:—"Two nests of the White-tailed Blue Robin, taken in May at 5000 feet elevation, were placed in the face of banks, among scrub near large forest. They were both hooded, with lateral entrance, and each contained three set eggs. They were composed of fine roots intermixed with a few leaves, and a few pieces of green moss were stuck here and there on the outside to aid in concealment. Externally they measured 5½ inches wide and the same deep; the egg-cavity is 2.5 inches wide by 1 deep, with an entrance of 2.25 diameter.

"I got two nests of *Notodola leucura*, both globular, with entrance at side, but the eggs are identical with those I sent you before. Many birds, I find, which naturally build a covered-in nest (hooded) do not trouble to make the hood part, if the situation is well sheltered by a closely overhanging rock, where the hood would be a superfluous part of the nest."

Numerous nests of this species sent me from Sikhim show that the nest is always a compact, more or less deep cup, more or less

hooded or domed where plants or rocks do not afford sufficient shelter. The chief material of which the nest is always composed are extremely fine black fibrous rootlets, felted closely together; a good many dead leaves are generally incorporated towards the base of the structure, and fern-leaves (withered or green) and green moss are in many cases more or less profusely woven on to the outer surface of the sides, of course in view to the more complete concealment of the nest. Where, as sometimes happens, the nest is placed in the cleft of a bank, it consists entirely of dead leaves and black rootlets, only a little moss being attached to the outer lip of the cup or the summit of the hood, as the case may be.

Mr. Mandelli took three nests at Lebong (elevation 5500 feet) on the 8th and 15th May and the 10th June; each contained three fresh eggs.

The eggs first sent me by Mr. Gammie are very regular, moderately broad ovals with scarcely any gloss, though the texture of the shell is very fine and satiny. They are of a uniform, very pale salmon-pink, entirely devoid of all regular markings, although, if examined in a very bright light, they appear to be excessively faintly (in fact scarcely perceptibly) freckled all over with the palest possible grey, which is absolutely invisible unless looked very closely into. This is not at all the egg that I should have expected from this species, but it agrees well with Mr. Hodgson's and Dr. Jerdon's accounts. The eggs measure 0.95 by 0.69 inch, and 0.91 also by 0.69 inch.

Numerous other eggs of this species agree well with the above description; but some are rather more glossy, some seem to want entirely the faint grey freckling, and many might be best described as white with the faintest possible *café-au-lait* tinge.

In length they vary from 0.86 to 0.95, and in breadth from 0.59 to 0.69; but the average of ten eggs is 0.91 by 0.65.

660. *Callene frontalis* (Blyth). *The Blue-fronted Callene.*

Callene frontalis (Blyth), *Jerd. B. Ind. i*, p. 496; *Hume, Rough Draft N. & E.* no. 340.

Mr. Blyth says that Mr. Hodgson figures the nest of the Blue-fronted Callene as domed and like a Wren's, with clay-coloured eggs. There is no such figure amongst the many hundreds of original drawings (of which those in the British Museum are mostly copies) lent me by Mr. Hodgson.

661. *Thamnobia cambaiensis* (Lath.). *The Brown-backed Indian Robin.*

Thamnobia cambaiensis (Lath.), *Jerd. B. Ind. ii*, p. 122; *Hume, Rough Draft N. & E.* no. 480.

The Brown-backed Indian Robin breeds throughout the plains of Upper India (not, however, I think, ascending the hills to any

elevation above 2000 feet) from March to August, during which period it has always two and often three broods. If disturbed, especially if the nest be robbed, it generally (but not always) constructs a fresh nest; otherwise it uses the same nest (only cleaning out the old and replacing it by new lining) for the whole season, and at times for two or three successive seasons. One pair reared eight broods in one and the same hole in my compound in three seasons. It builds commonly in holes in walls or banks, in niches in temples, under the eaves of huts, &c.; but it also builds not very unfrequently in thick bushes. In Mr. Nunn's garden at Bichpooree I found two nests between the bayonet-shaped leaves of plants of the *Yucca globosa*, wedged in against the stems.

The nest varies much in shape, size, and materials, according to situation and locality. When placed in holes they are usually merely soft, more or less circular, pads of soft grass, with a shallow central depression lined with horse or even human hair, fine roots or vegetable fibres, feathers, cotton, wool, or anything else soft that comes handy, with very frequently scraps of snakes' skins incorporated. Sometimes even in holes a regular but shallow cup-shaped nest is built, and this is always the case when bushes and, as a rule, when ledges in buildings or banks are chosen, and then roots and grass loosely but sufficiently firmly interwoven form the body of the nest, which is lined with similar materials to those used when nesting in holes. I have seen very neat nests, very different to the ragged pads which commonly satisfy our Robin, between 4 or 5 inches in diameter externally and nearly 3 inches in height, with a cavity some 2·5 in diameter and 1·5 in depth.

Four is the full complement of eggs, but they often lay only three, and I myself once found five.

Mr. W. Theobald makes the following note on the nidification of this species in the neighbourhood of Pind Dadan Khan and Katas in the Salt Range:—

“Lay in the second week of April: eggs four; shape pointed oval pyriform; size 0·79 by 0·60; colour greenish white, ringed and spotted with pale reddish and a little neutral tint; nest loose grass and bits of snakes' skins, placed in holes in the sides of nullahs.”

Colonel G. F. L. Marshall says:—“Very common in the Saharunpoor District. It is familiar in its habits, and breeds commonly in stations. I once found the nest cup-shaped in a bush, two or three times in a tuft of grass or aloe near the ground, but in five cases out of six the nest was on the ground in a hole, or on a ledge of a bank, or in the hole of a wall.

“I have taken three fresh eggs on 26th March,

”	three	”	4th April,
”	two	”	10th ”
”	two	”	16th ”
”	three	”	28th ”
”	four	”	28th May,
”	three	”	1st June,

and many others at intermediate times. The breeding-season may be said to extend from March to June. The nest is usually made of grass and lined with horsehair.

"I have found nests of this bird in very curious positions. One was built between two bricks in a native brick-kiln in course of preparation. The hen bird was sitting on the nest with the people working within a few feet of her. The nest would have been destroyed in the progress of the kiln long before the eggs would have been hatched. There were three eggs when I found it. Another nest was on the sill of a blind window in one of the canal chokis without an attempt at concealment of any kind; and a third was in the hole for the punkah rope to pass through the wall."

Professor Valentine Ball writes:—"The Brown-backed Indian Robin is very common in Chota Nagpur. With regard to its nidification I have the following note: 25th April. Found the nest of this bird with three eggs in a hole in a bank by the side of a much-frequented road. Eggs greenish white with olive-brown spots. The nest consisted merely of a few pieces of grass, &c. lining the bottom of the hole."

Mr. A. Anderson notes that this species "builds almost exclusively in holes of walls and banks. The nest is composed of grass, fibres, &c., and is generally lined with hair, not unfrequently with the addition of pieces of snakes' skins. It lays generally three and occasionally four eggs of a dirty greenish-white colour, speckled all over with reddish-brown spots, most thickly distributed, however, at the thick end. Some varieties are exceedingly pretty, especially those which have a purplish-red zone at the obtuse end instead of being freckled.

"Two pairs of these Robins built close to the Futtehghurh church three years ago: one pair took up their abode inside of a tin watering-pot which had been placed in a slanting direction in a bush; the other pair took possession of an old piece of cloth that had been thrown over the bough of a tree, and which formed a sort of loop or bag at the bottom, inside of which the nest was built. They both laid the usual complement of eggs, viz. three, but these fell a prey to the voracity of the so-called Blood-sucker (*Calotes versicolor*)."

Major C. T. Bingham writes:—"A common bird both at Allahabad and at Delhi. It breeds in holes in walls, sometimes making a large shapeless nest of bits of straw, cotton, feathers, &c., and sometimes barely lining the hole chosen with grass-roots, but invariably, whatever sort of nest it may build, having portions of cast-off snake-skin as part of the lining. It lays from March to the end of June. Four is the usual number of eggs, but I have found six."

Colonel A. C. McMaster informs us "that three pairs of these birds built about the roof of my house at Kamptee. One nest was composed of coir-matting stolen from me and lined with the red wool which had dropped from an old carpet daily beaten near the

spot; there were no snake-skins in the nest (*vide Jordon*), but in it were two or three pieces of the brilliant mica so abundant at Kamptee, and these ~~very~~ much resembled scales from snake-skins."

Writing from Saugor, but referring to his experience both in that district and in the Delhi Division, Mr. F. R. Blewitt tells us that this species "breeds in the latter half of April, May, June, July, and part of August. Builds in holes of walls, convenient fissures in rocks, and, what I have only observed *here*, on dwarf trees and bushes. On a jungle-bush $4\frac{1}{2}$ feet high I saw a nest supported by three upright twigs, and shot the male bird as he flew off it. I have kept the bird and the nest. Subsequently I found a second nest on the upper branches of a keekur, near 6 feet high. Other nests were taken from plum and reunj bushes.

"The nests, if they can be so called, in holes of walls and in rock-fissures are simply constructed of loose, coarse, and fine grass, with occasionally a few feathers of sorts to form, as it were, an upper layer. Those found in bushes were circular, some $4\frac{1}{2}$ inches in diameter, the lower portion of coarse grass and roots well put together, with the egg-cavity cup-shaped, some 3 inches in diameter, lined with fine grass, khus, and a few horsehairs. In one nest small pieces of cotton were substituted for the hairs. Four appears to be the regular number of eggs."

From Sambhur Mr. R. M. Adam records that "the Indian Robin is very plentiful here, and breeds from March to June. A pair which built in my verandah, in April, had two eggs in the same nest on the 8th May, or about ten days after the first brood left the nest, and later they reared a third brood in the same nest.

"The nest is made in holes, in trees, stone or mud walls, the thatch of houses, or in prickly-pear bushes. Sometimes it is very carelessly made, at other times the bird bestows a good deal of labour on it. When carelessly made, a few tags of sheep's wool and some human hair, rounded into a cup-shape, suffice; but when carefully made it is constructed of fibres, grass, and grass-roots, all firmly matted together, and the egg-cavity is lined with different kinds of hair. The outer diameter of the nest measures 4 inches; the inner $2\frac{1}{2}$ inches, with a depth of $1\frac{1}{4}$ inch. In each of the numerous nests which I have taken there were either one or two pieces of snake's skin or a few pieces of mica, which is rather common about the roads when the Mohurru *tazzeas* are being carried about. Two seems to be the normal number of the eggs, but I have sometimes found three; they are of a pale greenish colour, some with spots, and others with freckles of various shades of reddish brown. One egg I possess has a few very fine spots, while at the thick end there is a lovely zone of lilac and reddish brown."

Lieut. H. E. Barnes, writing of Rajputana in general, says that this Robin breeds from March to the middle of July.

Colonel E. A. Butler writes :—"The Brown-backed Indian Robin breeds in the neighbourhood of Deesa in February, March, April, and May. The nest is usually placed in holes of walls, banks, gate-posts, &c. I have taken nests on the following dates :—

" 1876.	March 27th,	a nest containing 3 fresh eggs.
"	29th,	" 4 "
April	3rd,	" 2 "
"	5th,	" 3 "
"	"	" 4 "
"	9th,	" 4 "
"	20th,	" 3 incubated eggs.
May	3rd,	" 2 fresh eggs.
"	5th,	" 3 "

"One of the nests taken in April was built in a room of a bungalow inside one of the pigeon-holes of an office writing-desk which was in constant use. Some nests are very carelessly put together, consisting of tufts of goat's hair, dry grass, &c., and there is generally a piece of snake-skin, lead paper, tinsel paper, or some coloured paper in the lining.

"The eggs taken in May were always much smaller than those taken earlier in the breeding-season, which is probably attributable to exhaustion.

"This species breeds at Mount Aboo, probably twice during the hot weather, but March is the best month to look for fresh eggs."

Mr. J. Reid, writing from Lucknow, says :—"It generally—almost invariably—nests in holes in houses, masonry or mud walls, and old deserted buildings of any kind, occasionally in nullahs and ravines." And he records the finding of nests from March 10th with incubated eggs to July 7th with hard-set eggs.

The late Captain Beavan noted that "this bird (the 'Suya' of the Bowries) is found in great abundance in the Manbhoom District, but more especially so in the breeding-season; and I am inclined to think that many migrate thither in March for that purpose. At the end of March and the beginning of April the jungles swarm with them, and as many as fifty eggs of this species alone have been brought to me in one day. As observed by Mr. Theobald, it shows a great partiality for fragments of cast snake-skins in the construction of its nest, which is in general a loose structure roughly made of grass bents and fibres, and lined with horsehair. It lays from three to four eggs, of a dirty white colour speckled with reddish-brown spots, most thickly massed about the blunt end, in some forming an ill-defined ring."

He added, writing from Umballa towards the end of October :—"I have noticed that this species, which is so very abundant here a little later, and which breeds here in numbers in February and March, has almost entirely disappeared and is conspicuous by its absence."

I have not myself as yet been able to verify the fact of this

species migrating during the breeding-season. As far as I have observed, where it resides during the winter there it breeds during the summer.

In shape these eggs, which are moderately glossy, are commonly somewhat elongated ovals, more or less pointed towards the small end. Considerably elongated varieties are common, far more so than in *Copsychus saularis*; the ground-colour is white faintly tinged with either green, pink, pale brown, or even cream-colour, green being the most common. The general character of the markings is a fine close speckling and mottling of different shades of reddish brown, but they vary very much both in their character, boldness, extent, and intensity. In all the markings are somewhat more dense towards the large end, where in many they form a more or less confluent cap. I have specimens before me in which, with a small confluent intensely deep brown cap, the rest of the surface is only thinly speckled with dingy yellowish-brown points; others are *finely* and closely speckled, and streakily spotted over the whole surface, so as to show but little of the ground-colour anywhere, and with scarcely a perceptible concentration at the large end; while others again are pretty boldly streaked and spotted, as in the common type of *Copsychus saularis*; but these latter are somewhat exceptional forms, the general characteristic of the markings being, as I have already remarked, fine pin's-point specklings closely crowded and anastomosing into dotty streaks. Occasionally pale inky-purple spots underlie the primary markings, but these are only perceptible on a close examination of the egg. As in the case of *Copsychus saularis*, the eggs of this species appear to me to show no relation to those of the *Saxicolinæ*.

In length the eggs vary from 0.72 to 0.88, and in breadth from 0.48 to 0.67; but the average of fifty-seven eggs measured was 0.79 by 0.59.

662. *Thamnobia fulicata* (Linn.). *The Black-backed Indian Robin.*

Thamnobia fulicata (Linn.), *Jerd. B. Ind.* ii, p. 121; *Hume, Rough Draft N. & E.* no. 479.

This and the last, *T. cambuiensis*, constitute another of those puzzling pairs of Northern and Southern forms which it is very doubtful to me whether we ought to retain as different species.

The following notes refer to the Robins which are found at Ahmednuggur in the Deccan and south of that place. They may be considered typical *T. fulicata*.

From Ahmednuggur in the Deccan the Rev. H. J. Bruce sent me the following note:—

“*May 25th*, 1869. Found a nest of *Thamnobia fulicata*. It was reported to me in the morning as having two eggs and one chick, but when I went to it in the evening it contained two chicks and only one egg. I secured the egg, which was nearly ready to hatch.

The nest was built under a bank in a hilly and uncultivated field. It was very neatly made of fine twigs or roots and lined with a layer of hair. The egg-cavity was about $2\frac{1}{2}$ inches in diameter and $1\frac{1}{2}$ inch deep."

Mr. E. Aitken remarks:—"I have found many nests of this Robin at Poona, and one, I think, at Khandalla. Poona is about 2000 feet above the sea.

"I cannot give the dates very particularly. I took fresh eggs from a nest on 3rd April, 1871, and found another on the 15th of the same month. By that time I noticed that some young ones had left their nests. I believe I have found them *building* at all times from the beginning of February, or earlier, to at least the beginning of May.

"They breed on the bare rocky plains, or in the cantonment among houses. In the former case a hollow in the ground, either wholly or partly covered by a stone, is almost invariably the situation. I believe this hollow is in many cases widened, if not made altogether, by the birds. In the neighbourhood of houses any suitable hole in a wall or roof is chosen. I have seen a nest in a thatch roof. They never build so high as *Copsychus saularis*. I have not found a nest that I could not reach from the ground.

"The nest, which I must describe from recollection, is not more than 3 or $3\frac{1}{2}$ inches in diameter, internally neatly made of roots and fibres. I think I found, once at least, a piece of snake's skin in it. It has no very distinct lining.

"I have never found more than three, or less than two, eggs. These were very thickly spotted, especially at the larger end, with dull purplish brown on a pale bluish-white ground. I do not think they have two broods in the year. They only breed in the hot season, and have hardly time for two successive nests. If they build twice in the same place, or ever use the nests of other birds, it is only by accident."

Colonel Butler writes:—"Belgaum, 23rd June, 1880. A nest in the hole of a bank about 3 feet from the ground by the roadside, containing two fresh eggs. It appears to have been a second nest, as I found a nest presumably of the same pair of birds in another bank close by, in April, containing three young ones. The nest was composed of fine roots and oakum (or coir), with one or two small pieces of rag round the edge in front. The eggs were pale greenish white, moderately speckled and spotted all over with dark brown and pale and dark yellowish brown, underlaid at the larger end with inky purple or slate-coloured markings, the whole forming a dense cap at the large end."

Mr. Benjamin Aitken has the following note:—

"The Black Robin of the Bombay Presidency builds on the ground, as well as in holes in walls, but its nest is often found in haystacks, and I have seen one between the broad leaves of a cactus and another in a lamp hanging under the porch of a bungalow.

"I have the following notes of dates of breeding:—

- "15th-31st March. Poona. Several nests with eggs.
 "10th April. Khandalla. Two young ones, almost fledged.
 "17th " Poona. Two eggs, new laid.
 "8th May. Khandalla. Three eggs; two much incubated
 and one addled.
 "10th " Poona. Newly fledged birds are common.
 "13th " " Pair, building a nest.
 "14th " " Saw a newly fledged bird.
 "16th June. " Three eggs; first laid on 11th.

"I am positive that *Thamnobia* has two broods at least in a season; for I have seen a pair that frequented our compound at Poona followed by two young ones within a month of each other. The nest with two eggs recorded on the 17th April, 1873, was constructed in an extraordinarily short space of time; for I found it under a clod of earth in a field that had been ploughed up not ten days before.

"Though the Black Robin will build close to where people are passing to and fro, it is very watchful against being observed, and forsakes its nest most readily. The feathers of the young birds grow very fast after they have left the nest. It is no unusual thing, I think, for one of the eggs in a nest to be addled."

Mr. H. Wenden has furnished me with the following interesting account of the breeding of this Robin:—

"Regarding the Black-backed Indian Robin, of which I send you seventeen eggs, taken from eight different nests in June and July, I have made the following notes:

"With the exception of one, taken from a crevice in a rock-cutting about 100 miles on the Madras side of Sholapoor, all the nests were taken in Sholapoor itself, which is about 1700 feet above the sea.

"The earliest date upon which I observed a nest was on 1st June. It was then nearly complete, and on 4th June the first egg was laid. The great months for these nests are undoubtedly June and July, but I observed one late in August (the 27th, I think).

"The birds are in no way particular as to the situation of a nest. Some I have found in railway-cuttings, where several trains passed daily within 8 feet of them; others in walls bounding much-frequented roads; one on the top of a wall under the thatch of an inhabited hut; another in a hole in the gatepost at the entrance to my compound, through which people were constantly passing.

"The position of the nest is, as a rule, in a hole in a mud wall, a crevice in a stone wall, or in a cutting-side. I have only observed two instances in which this was not the case, when I found one nest on the top of a wall (9 feet high) under the thatch, and another built on the side of a haystack. As a rule, the height from the ground was between 3 and 5 feet.

"The external dimensions of the nest vary with the nature of the hole in which it is built; but no matter how large the hole may be, it seems to be the habit of the bird to fill up the whole

space level with the top of the nest. The internal dimensions are about $2\frac{1}{2}$ inches diameter by $1\frac{1}{2}$ deep. The outer materials are coarse but soft grasses of sorts, dry stems of neem-seeds, and here and there a feather. This is generally carelessly and ruggedly put together; but the lining of very fine roots, grass, hair, wool, and often pieces of onion-peel and snake-skin is neatly woven.

"The largest number of eggs I observed in any one nest was three. Two was the smallest number incubated, and one nest had two young ones in it. I only knew one pair of birds breed twice in the same season, and they used the same nest for the second occasion. They lay *daily*. Both parents share the labour of building the nest, and also of feeding the young; but I have never seen the male bird sitting on the nest. I have for hours watched a male 'flirting' about in front of the hole where the hen was sitting, or perched close by, warbling prettily, and several times he took food to her."

Messrs. Davidson and Wenden remark of this bird in the Deccan:—"Abundant, and breeds from April to July."

Mr. G. Vidal writes from the South Konkan:—"Common everywhere on the bare and rocky hill-sides and about villages. Breeds in March and April, in crevices between the boulders, or rocky hill-sides."

Mr. W. T. Blanford tells us:—"I found a curious nest made by this bird, and in a singular position, viz. inside the bamboo of a dhooly in the verandah of Captain Glasford's house at Sironcha. The principal material of which the nest had been composed was a number of short fragments of string; with these were grass, horsehair, and a snake's skin. The nest contained three eggs, as usual."

Mr. Iver Macpherson records the following note from Mysore:—"I have found nests of this bird in April, May, and June. The nests are generally placed on the ground, under some stone, tuft of grass, or small bush; but once Major McInroy found the nest in a small cactus-bush, a foot or so from the ground. Last year a pair built their nest in an old elephant's skull lying out in my compound at Mysore. Three is the usual number of eggs laid; on one occasion I found two slightly incubated."

Mr. C. J. W. Taylor, also writing from the same State, says:—"Plentiful everywhere. Breeding in April and May in the vicinity of villages."

And yet a further note from Mysore. Mr. W. Davidson says:—"On the 23rd May last year I found a nest of this species, containing three partially incubated eggs. The nest was placed under a bush, on the very edge of the road."

Lieutenant Burgess, in his notes on the habits of birds in Southern India, tells us of this species that "it breeds during the months of March, April, and May, building its nests in the holes of walls and rocks, as also in hollows under tussocks of grass. I subjoin some notes on the subject:—

"*May 9th*, 1850.—When passing outside the wall of a town,

an Indian Robin flew off the wall and hovered before me, uttering a sharp hissing cry. Knowing by her manner that she had a nest near, I searched in the wall and found the nest, composed of rotten grass and straw, and some thread of woollen cloth. The nest contained three young ones, quite unfledged; their skin was of a black-lead colour.

"March 19th, 1851.—Found in a hole in the rocks the nest of the Indian Robin, containing two eggs.

"March 27th, 1851.—Found the nest of the Robin, containing two eggs, built at the foot of a little tuft of grass in a hole amongst the roots.

"The egg of this bird is of a very pale dusky blue, spotted all over with light brown and a few purplish spots here and there; length rather more than 0·8 inch by 0·6 in width."

Mr. Layard records that in Ceylon he has procured their nests, which are composed of hair, moss, and dry grass, in the months of June and July in Colombo, in December and April in the north. The eggs are from three to five in number.

And Colonel Legge says:—"The Black Robin breeds during the months of March, April, May, and June in the Central, Western, and Southern Provinces of Ceylon, the majority of nests being built at the end of April."

Numerous eggs sent me by Mr. H. Wenden from Sholapur closely approach those of the northern form.

In shape they are typically somewhat elongated ovals; the shell is fine and close, and fairly glossy. The ground is white with, in many specimens, a faint greenish or pinkish tinge. The markings, specks, and spots thickly set, sometimes chiefly at the large end (where they are always most numerous, and usually more or less confluent), more usually over the whole surface of the egg, prove, when closely examined, to consist of varying shades of reddish brown and brownish yellow, more or less intermingled with pale lilac or reddish purple.

I should add that in some eggs the markings are finer and more speckly, in others they are rather bolder and more blotchy.

These eggs are rather larger if anything, more elongated at any rate, if not broader, than those of *T. cambaensis*. They vary in length from 0·76 to 0·84 inch, and in breadth from 0·55 to 0·62; but the average of seventeen is 0·82 by 0·59.

663. *Copsychus saularis* (Linn.). *The Magpie-Robin.*

Copsychus saularis (Linn.), *Jerd. B. Ind.* ii, p. 114; *Hume, Rough Draft N. & E.* no. 475.

The Magpie-Robin breeds throughout India. Many resort during the nesting-season to the Dhoons and Terrais that skirt the Himalayas, and to the lower ranges of these latter, in which they may be found nesting up to an elevation of at least 5000 feet.

They lay from the end of March to quite the end of July, but by

far the majority of eggs are to be found alike in hills and plains during the latter half of April and May. So far as my experience goes, and I have taken scores, the nests are invariably placed in holes in trees, banks, or walls, or under the eaves of huts. I have never seen or personally heard of a well-attested instance of their breeding in bushes; but it is still pretty certain, from what Captain Beavan and others have recorded, that they do, at any rate occasionally, nest in such situations.

In the plains the nest is generally composed of roots, grass, fibres, and feathers; but in the hills moss and lichens are largely used. In shape the nest is typically a broad, very shallow, loosely built saucer, some 4 or 5 inches in diameter, and with a central depression about an inch in depth; but they vary much, according to the shape and size of the cavity in which they are placed. Some are more regularly cup-shaped, while many are mere *pads*. A few small twigs, or a few dead leaves, may at times be found doing duty as a foundation; but whether placed there by the bird, or deposited by the wind anterior to the construction of the nest, may be doubtful. Five is unquestionably the full complement of eggs, although once or twice I have taken four partially incubated ones.

Captain Unwin says:—"A nest that I found in a hole in a tree about 4 feet from the ground in the Agrore Valley, on 18th May, 1870, contained four fresh eggs. It was a moderately large saucer, about 4½ inches in diameter and nearly 2 inches thick, composed externally of rather coarse grass, and the shallow egg-depression lined with finer grass and grass-roots."

Colonel G. H. T. Marshall records that this species "breeds freely at low elevations all round Murree."

I have found it breeding in the Sutlej Valley below Kotegurh, and near Solon below Kussowlee.

Captain Hutton says:—"Copsychus saularis arrives in the hills up to about 5500 feet in the beginning of April, returning to the Dehra Dhoon early in the autumn. In the Dhoon it breeds in May and June, constructing a shallow nest of fine woody flower-stalks, intermixed with fine roots and the dry tendrils of climbing plants, with a little moss externally, and placed within a hole in some large tree, or in a bank or wall, where it lays five eggs of a pale bluish green, thickly spotted and blotched with purplish brown, and showing an imperfect ring of nearly confluent blotches at the larger end. There is, however, great variety both in the number and size of spots and in intensity of colouring, some being blotched as well as spotted, others being simply and uniformly freckled with rufous brown without any indication of a ring at the larger end, and in these the size is somewhat less. Having obtained five or six of these typical nests, and shot the old birds for examination, there can be no doubt about the correctness of the foregoing remarks; yet at the same time I am still fully convinced that the nest with white eggs formerly noticed (Journal Asiatic Society Bengal) as having been taken from a hole in a bank was a mere

accidental variety, for the nests are the same as to materials and situation, while the circumstance of the pinky-white eggs appears to me to be the effect of some temporary derangement of the system, precisely as we sometimes detect a white specimen in the nest of the Hill-Mynah (*Eulabes intermedia*)."

I may add that I do not doubt that Captain Hutton was quite right, and that his "carneous cream-coloured" eggs verily belonged to this species. It is well known that eggs of Passerine birds, normally blue or bluish green, occasionally assume this pinky shade. I have several such of *Prinia inornata*.

Mr. Brooks tells us that the Magpie-Robin is "common at Almorah and near all villages. The nest is formed under eaves of houses, or in holes in trees, but the bird gives a decided preference to a dwelling-house. Like the English Robin it is a most sociable bird, and appears to prefer the proximity of man.

"In Kumaon it lays about the middle of May."

He added in *epist.*:—"The egg is a miniature of some of those of the Blackbird or Ring-Ouzel."

From Nynce Tal Colonel G. F. L. Marshall says:—"I found a nest with five eggs at Bheem Tal in a hollow tree, about 6 feet from the ground, on the 9th or 10th June. The hole was lined with roots and grass to form the nest."

From Nepal Mr. Hodgson remarks:—"The female usually lays five spotted eggs, bringing up from three to four young ones, and but once a year, unless the first brood has failed or been rifled from her. The nest is carelessly made of grass, but is always placed in a secure and sheltered position, commonly a hole in a wall, sometimes the interior of a low thick prickly plant."

Dr. Scully, also writing of Nepal, says:—"Its habits and fine song in the breeding-season are well known and have often been described. It breeds in May and June; half a dozen nests, found in those months, were placed in holes in walls and trees."

From Sikhim Mr. Gammie notes that he "took a nest on the 17th June, at an elevation of 2500 feet below Rungbee, which contained three fresh eggs. It was in a hole of a tall tree, nearly halfway up, and was little more than a pad of rather coarse roots."

Colonel G. F. L. Marshall, writing from Saharunpoor, says:—"I send the bird and a pair of its eggs. I have found only one nest, and this was on the 23rd April, in a hole in the wall of a building. The nest was made of fine twigs, very neatly shaped, and lined with fibre; there were five fresh eggs in it."

Most of the nests that I have taken in Bareilly, Agra, and Etawah were found in May.

Major C. T. Bingham writes:—"Personally, both at Allahabad and at Delhi, I have found nests of this bird in May and June in holes in trees. But at Allahabad a man I had marking down nests for me brought me a loosely-built shallow cup of grass-roots lined with horsehair, containing five eggs of this bird. He said he had found it in a thick bush, and that a female dayal had flown off it."

Mr. George Reid tells us that he has found nests of this bird at Lucknow from May 22nd to July 15th.

Mr. R. M. Adam records that he "took a nest of this bird at Fyzabad, in Oudh, on the 4th May. The nest contained three eggs. It was situated in a hole of the wall of a mud hut."

Mr. F. B. Blewitt, writing from Saugor, remarks :—"On the 29th June I found the nest in the hollow of a large dried limb of a goolur tree (*Ficus glomerata*). It was made of coarse and fine grass and roots, placed to about the thickness of an inch at the base of the hollow. As to the lining, there were a few horsehairs. The structure as a whole was circular, with a diameter of 4½ inches."

Professor Littledale informs me that this Robin breeds in Guzerat, and that between May 30th and June 26th he took eight nests near his own house.

Writing of Rajputana in general, Lieut. H. E. Barnes states that this species breeds during April and May.

Captain Boys says :—"This very sprightly bird frequents the trees and bushes of the gardens, and, like the English Robin, carries its tail very erect, which gives it a bold appearance. It is very familiar, and has a sweet note. Its food consists of insects, and it builds in the chinks and holes of walls, forming its nest of small dry twigs and grass-roots, and laying five greenish-blue eggs, blotched all over with brown, but mostly at the larger end."

Mr. E. Aitken tells me that "in Bombay this bird commonly breeds in holes in the walls and roofs of houses. I recollect many years ago finding a nest under a large tile at the corner of the roof of a house. I looked at it on 30th June, when I found two young ones and an old egg. In Poona they seem to be scarcely so familiar. Last year, after the middle of May, I saw one carrying building-materials up to the middle of a cypress tree. As the trunk could not have contained a hole large enough to build in, they must have been making their nest simply among the dark foliage."

Mr. G. Vidal records this note from the South Konkan :—"Very common throughout. Breeds in May and June. One nest I found with four eggs in the hole of a tree was lined profusely with the dry leaves of the casuarina tree."

Messrs. Davidson and Wenden, writing of the Deccan, say :—"Commonish. Nest taken at Satara in May."

Colonel Butler writes :—

"Belgaum, 18th April, 1879 : 4 eggs about to hatch. The nest, consisting solely of a collection of stems of dried leaves loosely put together, was placed in the hole of a tree about 9 feet from the ground.

"Another nest exactly similar in the same neighbourhood on the 24th May, containing 4 fresh eggs.

"Another on the 1st June in the same station, containing 3 slightly incubated eggs.

"Nests are common in this part of the country, and May seems to be the month in which most of the birds build.

"Belgaum, 4th April, 1880 : a nest in the hole of a tree about

9 feet from the ground, containing 4 fresh eggs. The nest consisted solely of the stems of dry leaves. Another nest, exactly similar, on the 6th April, about 12 feet from the ground, containing 3 fresh eggs; probably four would have been laid if the others had been left, as the hen bird was not sitting or near the nest. Another nest on the 23rd April in a hole of one of the masonwork pillars that are substituted for gateposts in this part of the country, containing 4 fresh eggs. 27th April, three more nests in holes of trees, each containing 4 fresh eggs. 7th May, another nest containing 4 fresh eggs. 13th May, 4 fresh eggs. As a rule, the nest is usually built in holes of trees varying in height from 4 feet to 15 feet from the ground.

"17th May, 3 fresh eggs. 27th May, 4 incubated eggs. 28th, 4 fresh eggs. 10th June, two nests, each containing fresh eggs. 12th May, a nest containing four eggs, two of which were quite fresh and the other two much incubated; the nest was built in a hole from which I had taken four eggs about a month before, and apparently by the same pair of birds."

Mr. J. Darling, Jun., informs me that on the 29th March, at Vythery, S. Wynaad, he took a nest at an elevation of about 2300 feet.

"The nest was placed in a hole in a blackwood tree about 6 feet from the ground. The aperture of the hole was about 6 inches in diameter, and the hole ran downwards for about 8 inches. The nest was at the bottom of the hole. A few twigs served as a foundation, and on these was placed a circular pad of fibres, roots, and moss, 5 inches in diameter and 3 inches in thickness, with a shallow central depression lined with finer fibres, in which rested five eggs."

Mr. C. J. W. Taylor states that in Mysore, at Manzeerabad, this Robin is common everywhere, breeding in April and May.

From Ceylon Mr. Layard tells us that it is seldom seen far away from human habitations, about which it commonly builds, though the nest is often placed in a thick bush or hollow tree. The eggs, four in number, are bright blue thickly spotted with brown at the obtuse end.

Colonel Legge writes:—"In the west and south of Ceylon this Robin breeds between the months of February and July, having apparently more than one brood in the season."

Writing from Furreedpore, Eastern Bengal, Mr. J. R. Cripps says:—"Very common, and a permanent resident; affects the haunts of man; nests in cavities and holes in trees and holes in buildings. In the Dacca district I once saw a nest in a bunch of the 'Kuch kela' (*Musa sapientum*); two of the smaller bunches were about four inches apart, and in the cavity thus formed the bird had made its nest and reared three young; the nest was only seven feet from the ground. Another nest was placed in a hole in a date-tree, and was only three feet from the ground. Although they always build in holes, in every one they form a pad of fine grasses and roots with a tiny depression for the eggs, of which I

have never come across more than four and sometimes only two in a nest; if the eggs are removed, they lay again in the same nest. I have taken hard-set eggs as early as the 7th April in this district and up to the 15th June."

Mr. James Inglis tells us that in Cachar this species is "very common, and breeds during March, April, and May."

Mr. Oates, referring to this species in Pegu, says:—"I have found nests with eggs from the 30th April to the 20th May. In Burma they almost invariably select a large hollow bamboo, many of which are generally to be found lying about the verandahs and cucumber-framings of the native houses, and place their nest about two feet inside, nearly up to the first joint. They also build in holes of trees."

Mr. Swinhoe very correctly remarks:—"Lieutenant R. C. Beavan says (Proc. Zool. Soc. 1864, p. 376) that *Copsychus saularis* 'builds in bushes.' This is remarkable for so genuine a Robin as this bird is. In Amoy I have only noticed its nest in the holes of walls, banks, or houses, oftenest in some corner of the under-roof or beaming of a verandah."

This is quite my experience here, and that of nearly every one who has communicated with me on the subject.

The eggs are typically oval, neither very broad nor very narrow; somewhat elongated, pyriform, and almost globular varieties also occur; they are moderately glossy. The ground-colour varies as much as does the size and shape of the egg. In some it is greenish, in others greenish white; while in others it is a beautiful pale sea-green, or, again, a delicate pale, only slightly greenish blue. Many of the eggs are perfect miniatures of eggs of *Merula similima*, and recall varieties of those of the English Blackbird, which, indeed, are almost the only English eggs with which I am familiar to which their colouring at all approximates. They are all streakily blotched and mottled with different shades of brownish red—some comparatively thinly, generally somewhat densely, and occasionally so closely as to leave but little of the ground-colour visible. In all cases the markings are most numerous at the large end, where they very commonly form a conspicuous irregular mottled cap. Occasionally, but rarely, small specks and spots take the place of streaky blotches, and the smaller end is almost entirely free from markings. Faint underlying spots of pale inky purple are traceable in a few specimens. In the extent and bold streaky character of the markings these eggs seem to me to stand apart from those of the *Saxicolina*, where Jerdon places the genus, and to approximate to those of the *Turdina*, where Gray locates it. No doubt the eggs show a strong affinity to those of *Thamnobia*, but this latter also has no business, according to my view, amongst the *Saxicolina*.

It is noteworthy that some specimens of the eggs pretty closely resemble the peculiar variety of the Nightingale figured by Mr. Hewitson, pl. xxxiii. fig. 2.

In length the eggs vary from 0.78 to 0.95, and in breadth from 0.6 to 0.75; but the average of forty-three eggs is nearly 0.87 by rather more than 0.66.

664. *Cittocincla macrura* (Gm.). *The Shama*.

Kittacincla macroura (Gm.), *Jerd. B. Ind.* ii, p. 116.

Cercotrichas macrourus (Gm.), *Hume, Rough Draft N. & E.* no. 476.

The Shama is a permanent resident of the warm and well-watered jungles of the Peninsula of India and of Burma; but my only information in regard to its nest and eggs is from Tenasserim and Pegu.

Well might Jerdon doubt that Philipp's Shama, described as perching on walls and breeding in houses, could be this species *. In the North-Western Provinces it is absolutely unknown, except in the lower outer regions of the Himalayas and the various Terails and Dhoons that skirt their bases.

As to its nidification in Tenasserim Mr. Davison writes:—"I have only found two nests of this bird. The first I obtained on the 17th April, on the road to Meeta Myo, about 4000 feet above the sea-level. It was in a hole in an old stump growing on the side of a mountain torrent. It was built of dry leaves and twigs, and the egg-cavity was lined with finer dry twigs. It contained two half-fledged young ones and one addled egg.

"The second nest I found at Shymootee, about 7 miles from Tavoy, on the 5th May, 1874; it was placed in a hole at the top of an old stump. The materials it was composed of were the same as in the other case, but much more in quantity. The hole went rather deep, and the bird had filled up the cavity to within about 4 inches of the top of the stump, thus making the depth of the nest from top to base of foundation more than 12 inches. The hole in the stump measured only 3·5, the egg-cavity being 3 inches in diameter. The nest contained two partially incubated eggs and one addled one."

Major C. T. Bingham writes also from Tenasserim:—"The following is a note about its nidification:--

"On the slope of a steep spur of the east watershed range of the Meplay river, in dense bamboo forest, I found, on the 4th April, 1878, a nest of the above bird. A Woodpecker had made a hole in a partially dry wahbo bamboo (*Bambusa brandisiana*) of immense girth. Of this the Shama had taken advantage, and having stuffed up the hollow from the next knot below to within three inches of the hole with dry bamboo-leaves, had above that made a loose cup-shaped nest of twigs and roots. I was eating my lunch, seated on a rock not far from the bamboo in question, and saw the female, after making two or three short flights and balking herself in the direction of the hole, finally enter it. I approached very cautiously, and stuffing my handkerchief into the entrance-hole, managed to secure eggs and bird. The former were four in number, slightly set, of an oily green colour, much spotted, speckled, and dashed with umber-brown. They measured

* But Lieut. H. E. Barnes has explained that Philipp's Shama was *Cercomela fusca* (*Journ. Bomb. Nat. Hist. Soc.* ii, p. 56, 1887).—Ed.

respectively, $0.9'' \times 0.62''$, $0.87'' \times 0.62''$, $0.85'' \times 0.61''$, and $0.85'' \times 0.62''$."

Mr. Oates records the following from Pegu:—"Builds in hollows of trees from 2 to 20 feet from the ground. The nest is a shapeless mass of leaves, sufficient to fill the hole, and lined with fine grass. I have found nests on May 27th and June 3rd with eggs. The number of eggs appears to be four. They are not unlike some of the eggs of *C. saularis*. Tolerably glossy, ground-colour greenish, and the whole shell is thickly freckled and streaked with rich brown with a tinge of rufous. The eggs vary in length from $.89$ to $.79$ and from $.64$ to $.6$ in breadth."

Mr. J. Darling, Jun., says:—"17th April. Took 3 nests of *C. macrura*: one nest with 3 hard-set eggs, one with 3 hard-set and 1 rotten egg, and the other with 4 fresh eggs. This last was built in a hole of a tree 4 feet from ground, in open forest, and was composed of a few twigs, lined with a few fern-roots: a very poor nest, with scarcely any depression. 20 miles east of Tavoy."

The eggs are moderately broad ovals, a good deal compressed towards the small end and exhibiting a slight pyriform tendency.

The shell is fine and compact and has a slight gloss.

The eggs remind one a good deal of some of the Larks' eggs. The ground appears to be a dull greenish-stone colour (but very little of it is visible), and it is everywhere very densely freckled, in some rather streakily, with a rich almost raw-sienna brown, in amongst which dull purplish markings are, when the egg is closely looked into, found to be thickly mingled. The combined effect, looked at from a little distance, is of a dense ruddy purplish-brown mottling.

In some eggs the markings are not quite so dense, and more of the ground-colour is visible, then not unfrequently a pale sea-green. Taking the eggs as a body they may be best described as slightly larger, more densely marked, and deeper coloured editions of those of *C. saularis*.

But I have occasionally seen eggs of a somewhat different type in which the ground-colour was only greenish white, and in which the primary markings were a decidedly reddish brown, and the secondary markings pale purple.

Occasionally the eggs are very elongated, and either much compressed towards the small end or distinctly pyriform. Taking them as a whole, I should say they have a very fine amount of gloss.

The eggs are small, it seems to me, for the size of the bird. The few we have vary from 0.81 to 0.92 in length, and from 0.6 to 0.67 in breadth.

Subfamily TURDINÆ.

667. *Merula simillima* (Jerd.). *The Nilghiri Blackbird.*

Merula simillima (Jerd.), *Jerd. B. Ind.* i, p. 525; *Hume, Rough Draft N. & E.* no. 300.

Of the Nilghiri Blackbird Mr. H. B. P. Carter says:—"At Conoor, on the Nilghiris, I have found nests of this bird from the 25th of March to the 18th of May, on which latter date a nest was being built. The nest is always in the fork of a tree or shrub, varying in height from 3 to 20 feet from the ground. I found several in coffee-bushes, one on a tree-fern, others on rhododendron trees, and one on the Australian acacia. In shape it is hemispherical and open at the top. There is always a foundation of mud, and a superstructure of thin twigs or coarse fibres, and it is lined generally with fine fibres, but sometimes has scarcely any lining.

"I have found from one to three eggs. In the case of the single egg, the young bird was well developed, and as it was in a tree 20 feet from the ground, it is not likely that any eggs had been taken out. As I found six nests, each containing three eggs, I think that this must be the usual number; at the same time I have been told that a greater number are sometimes laid.

"This Blackbird builds its nest in a remarkably short time. On one occasion I saw a nest completed in four days. It is just possible that there may have been a portion of a day's work done before I saw it; but even five days is a very short time for so small a bird to complete a nest which must weigh at least 2½ lbs."

The nests of this species, of which I owe a magnificent series to my friend Mr. Carter, are always, apparently, very massive structures, containing an inner skeleton of mud, completely hidden from sight by an exterior coating of moss or lichen, or fine or coarse grass-roots, and an interior lining of fine grass-roots. The bird appears to lay a light foundation of dead leaves, lichen, or fern, and on this to build a more or less deep cup on the wattle-and-dab principle—a few coarse grass-roots twisted together as a skeleton, and then thickly plastered with mud or wet mould. The cup thus made is often about 4½ inches in diameter and 2½ deep. It is then covered, externally, to the thickness of one or two inches with whatever materials are nearest at hand, grass or other roots, dry slender ferns, soft green moss, or masses of tree-lichen. The interior of the cup is first lined with rather coarse roots, and then finished off with fine ones. No particle of the clay skeleton is visible in the finished nest, which may average about 7 inches in diameter externally, stands about 4 inches high, and has an egg-cavity some 3½ inches in diameter by 2 inches deep. In all the nine nests now before me the inner earthen framework is present, but in some it extends scarcely more than ½ inch up the sides of the nest, while in others it comes up to within ¼ inch of the upper

margin. Owing to the different materials used in different localities for the external coating of the nest, these vary much in appearance; but some of them, entirely coated with moss or lichen, are amongst the most beautiful structures that I know. The type of the architecture of the nest, as will be observed, is the same as that of the European Blackbird.

Dr. Jerdon tells us that he has "frequently found the nest, made of roots and moss, usually with four eggs, pale blue with dusky brown spots."

Mr. W. Davison remarks:—"With the exception of *Pratincola bicolor*, the nest of this species is the commonest at Ootacamund and its immediate vicinity. During April and the earlier part of May every thick shrub is sure to contain a nest, placed in a fork, generally about 12 or 14 feet from the ground. It is a large and very solid structure, composed internally of bits of stick, dead leaves, roots, and moss, within which is a tolerably thick stratum of clay, and within this again fine grass and moss-roots. I think I must have taken a hundred nests in my time. The eggs are normally four, sometimes five, in number, and very variable both as regards colour and form, but the ground-colour is generally a dingy bluish green, thickly mottled and freckled with brownish red."

Miss Cockburn, of Kotagherry, notes that "Blackbirds seldom lay more than four eggs, the ground-colour of which is a light green, with blotches and spots of a light red and brown. They generally build in thick bushes or trees, often on those the branches of which overhang streams of water. I once found a Blackbird's nest built in a bank just in a place a Robin would have chosen. The nest was quite exposed to view, and I frequently saw one of the birds sitting in the nest, while I rode past. This was quite unlike their general ideas of seclusion. The young brood came to an untimely end. They lay from April to July."

Captain Horace Terry, writing of the occurrence of this Blackbird on the Pulney Hills, remarks:—"Very common everywhere on the *sholas* on the top. They commence breeding in the middle of March, and were still breeding when I left in the middle of June."

Mr. Rhodes W. Morgan, writing from South India, says:—"This bird breeds on the Neilgherries from March to May, building a large nest of moss, twigs, wool, &c., with a clay cup in it, which is neatly lined with bent-grass and roots. The eggs are three in number, irregularly blotched with reddish brown, the blotches being more numerous towards the larger end, on a pale greenish-blue ground. This Blackbird sings most beautifully in the breeding-season; and they may then be heard at all hours, but especially towards evening, answering one another. Dimensions of an egg 1.25 inch in length by 0.91 in breadth."

The eggs are very similar to many varieties of those of the European Blackbird. In shape they are commonly a broad oval, pointed towards one end; but, as in the case of our English

favourite, the eggs are sometimes elongated and often perfectly oval, the smaller end being rounded and obtuse. The ground-colour varies somewhat, being sometimes of a beautiful bright blue-green, at others of a dull olive-green, and various intermediate shades occur. They are richly speckled, mottled, and streaked, and at times even boldly blotched, with brighter and duller, deeper and lighter shades of brownish red, not unfrequently underlaid by faint spots and clouds of purplish pink or grey. The markings vary a good deal in extent and frequency, but, in perhaps a majority of the eggs, form a more or less conspicuous and confluent cap at the large end. In some eggs all the markings are very fine and minute, laid on, as it were, with a very fine-pointed brush; in others they are coarse and streaky, and occasionally bold, blotchy, and well defined. Specimens occur which could scarcely be separated from varieties of the English Ring-Ouzel's egg. The eggs have usually a slight gloss, and some specimens are highly glossy. As already mentioned, in some specimens secondary markings, small purple clouds and spots, appear to underlie the red-brown blotches.

In length the eggs vary from 1.1 to 1.3 inch, and in breadth from 0.82 to 0.93 inch; but the average of thirty-five eggs measured was 1.17 nearly by 0.86 inch.

668. *Merula kinnisi*, Blyth. *The Ceylon Blackbird*.

Merula kinnisi, Bl., *Hume, Cat.* no. 360 bis.

Colonel Legge, recording the breeding-habits of this species in Ceylon, writes:—"The Blackbird breeds from April until June, building in a niche of a trunk, on a stump, or in a forked branch of a low tree; its nest is composed of grass, moss, and roots, strengthened with a few twigs, and is somewhat massive in structure, the interior being a deep cup lined with fine roots, most probably underlaid by a foundation of mud, as in the nests of other species. The eggs are four in number, of a pale green ground-colour, blotched evenly all over with faded reddish-brown and light umber, overlying smaller reddish-grey spots. Dimensions 1.05 by 0.82 inch.

"In the matter of situation, it has, however, a variety of choice, sometimes nesting, according to Mr. Holdsworth, in out-buildings at Nuwara Eliya, and occasionally choosing the site of a rock, as will be seen from the following experience of Mr. Bligh. He writes me:—"I have often found this charming bird's nest; on one occasion it proved to be a strange structure, composed of *seven distinct nests*, which were fixed among the roots of a bush which grew out of a perpendicular rock above the "Swallow's Cave" at Dambetenne: it contained three young ones. The situation no doubt proving very safe and suitable, induced perhaps the same pair to build successively on the old nests, all of which still presented a fresh green appearance, from the moss not readily drying in such a moist climate. Usually the nest is very like the English

Blackbird's, but smaller, and the same may be said of the eggs, except that they are rather rounder. These birds nest regularly near the Catton bungalow; and directly this important business is over they retire to the higher jungle, assembling in more or less numerous parties. I have seen as many as forty or fifty at the same time, in what might be termed scattered company; but this is a rare habit, and only to be accounted for by the abundance of favourite food in a particular locality."

669. *Merula bourdilloni*, Seebohm. *Bourdillon's Blackbird*.

Captain Horace Terry found the nest of this Blackbird on the Pulney Hills. He says:—"I found two nests at Kodikanal in 1883 of what I identified as this bird, and in each case shot one of the parent birds, which I sent to Mr. Hume*. There now seems to be great doubt as to the correctness of this identification, but I send description of nests for what it is worth. The first nest (May 18) was placed in the fork of a tree some fifteen feet from the ground, and was just like the nest of *M. simillima*. The body of mud, lined with fine grass and the outside with coarse grass and roots wound round it, and covered all over with green moss. A strongly built, rather shallow cup 3.5 inches across and 2 inches deep inside; 5 inches across and 4 inches deep outside. It contained one very slightly incubated egg, just like the egg of *M. simillima*. On 3rd June I found a similar nest with two fresh eggs, and shot the male bird."

671. *Merula nigripileus* (Lafr.). *The Black-capped Blackbird*.

Merula nigripileus (Lafr.), *Jerd. B. Ind.* i, p. 523; *Hume, Cat.* no. 359.

Mr. H. Wenden has found many nests of this Blackbird on the Ghâts near Khandala. He says:—

"6th July, 1879. Lonauli. Found nest with three young birds in a small euphorbia bush, 4½ feet above ground.

"27th July. Davidson and I found two nests, each with three eggs. One situated in the fork of a horizontal bough about 5 feet from ground, and the other on the point of a pollarded branch 8 feet from ground.

"2nd August. I found another nest with three eggs, 12 feet up in a euphorbia bush. I have found several other nests, some old and others building. This species seems to be breeding very freely about here (Lonauli, from 1800 to 2400 feet above the sea).

"On 27th July I shot both male and female from a nest, and Davidson and I identified them. The nests are composed of stout twigs and grass, covered externally with much earth and moss.

* These birds are now in the British Museum, and Captain Terry has identified them quite correctly.—Ed.

Internally they measure from $3\frac{1}{2}$ to $3\frac{3}{4}$ inches diameter by 2 deep, neatly lined with fine grass-stems, roots, &c.; the lining of one nest consisted entirely of the spines of casuarina."

Colonel E. A. Butler writes from Aboo:—"It breeds at Aboo in the rains, commencing nidification towards the end of the hot weather, but I was never fortunate enough to find a nest."

Mr. C. J. W. Taylor, writing from Manzeerabad, Mysore, says:—"Common all over the district. Eggs taken on the 25th May."

The eggs of this species are, typically, moderately broad, very regular ovals, but short broad, more or less pyriform varieties, and, again, considerably elongated oval ones occur. The eggs are always fairly glossy, and some have a fine gloss. The ground-colour varies from greenish white to a delicate pale sea-green, the markings, usually most dense about one or other end, where they often form a more or less regular cap or zone, are a rich brownish red and pale purple, and consist of specks, spots, blotches, and streaks, becoming sometimes quite confluent at one end of the egg, to which in some eggs they are almost entirely confined, while in others, with the exception of a slight tendency to conglomerate round the large end, they are pretty evenly distributed over the entire surface.

The eggs vary from 1.02 to 1.17 in length, and from 0.78 to 0.88 in breadth; but the average of 15 eggs is 1.08 by 0.82.

672. *Merula albicincta* (Royle). *The White-collared Ouzel.*

Merula albocincta (Royle), *Jerd. B. Ind.* i, p. 526; *Hume, Cat.* no. 302.

Colonel G. F. L. Marshall informs us that "near Naini Tal this Ouzel is only found on the top of Cheena 8000 feet above the sea, and is rather an early breeder. I found the young just fledged in the beginning of June, but was too late for eggs. Neither of the parent birds that were with the young ones were in the *castanea*-plumage, both had the neck distinctly ringed."

Two eggs of this species which, together with one of the parent birds, were brought from Native Sikhim about the end of June, are regular ovals, a little compressed towards the small end, and slightly glossy; the ground-colour is greyish white, and the eggs are spotted and speckled all over, more densely towards the broad end, with reddish brown and brownish red, and a number of underlying markings of purplish grey; they measure 1.23 by 0.87 and 1.22 by 0.85.

673. *Merula castanea*, Gould. *The Grey-headed Ouzel.*

- *Merula castanea*, Gould, *Jerd. B. Ind.* i, p. 526; *Hume, Rough Draft N. & E.* no. 363.

Very little is known of the breeding of the 'Grey-headed Ouzel. A nest containing five eggs was taken on the 20th April near Kotegurh, and Colonel C. H. T. Marshall took a nest at Murree.

The Kotegurh nest was placed in a bank, was 6 inches in diameter and 4 in height, composed of moss, with a good deal of dead fern in the base of the nest, and only a little earth, and lined with fine grass. The cavity was about 3·5 inches in diameter, and 2·75 inches in depth.

From Murree Colonel C. H. T. Marshall writes :—"Two nests in banks, in the beginning of June; eggs very similar to those of *M. bouboul*, but somewhat larger, being 1·25 by 0·8 inch. Captain Cock got two nests in the Sindh Valley, Kashmir. It is peculiar that this species always breeds in banks. All the Meruline birds breed from about 5000 to 7000 feet up.

"I believe some people say that *Merula albocincta* and *M. castanea* are identical. I therefore send a pair of birds of the latter, shot off the nest in full breeding-plumage, which may elucidate the matter. They must have two hatches in the year, as on the 20th April I got a nest with four eggs just ready to hatch, which must have been laid at the end of March. The nest, too, was at an elevation of nearly 7000 feet."

The eggs of this species appear to vary very much. What I take to be the typical egg is a somewhat lengthened, at times more or less pyriform, oval. A pale green ground, with very little gloss, thickly and boldly mottled and freckled all over with brownish red and pinkish purple. In another type nowhere is more than a pin's point of the ground-colour visible, the whole surface being excessively minutely freckled and speckled with brownish red, underlaid by faint reddish-purple clouds and stains.

In length they vary from 1·1 to 1·35 inch, and in breadth from 0·75 to 0·88 inch. Only eight eggs are measured, five from Kotegurh and three from Sonamurgh taken by Captain Cock.

676. *Merula bouboul* (Lath.). *The Grey-winged Ouzel*.

Merula bouboul (Lath.), *Jerd. B. Ind.* i, p. 525; *Hume, Rough Draft N. & E.* no. 361.

The Grey-winged Ouzel breeds throughout the outer ranges of the Himalayas, at any rate from Darjeeling to Murree, in and about the skirts of forests, from an elevation of say 4000 to 7000 feet. It lays from the end of April to the early part of August, but the great majority lay in May and June.

The situation of the nest varies: it is sometimes placed on the ground, in some hollow of a massive root, or in a fallen trunk; sometimes on a ledge of rock, and sometimes in a fork of some thick tree of moderate size, at no great elevation from the ground.

The nests of this species closely resemble those of the Nilgiri Blackbird. There is the same internal wattle-and-dab framework, the same massive external coating of moss and delicate ferns, and the same soft internal lining, in the case of this species most commonly of fine dry grass. The specimens before me are fully

7½ inches in external diameter—beautiful masses of moss, lichen, and dry feathery fern, standing something like 5 inches high, with deep egg-cavities, 3½ inches across by 2½ in depth. As far as I can judge, *M. bouboul* employs less mud in the construction of its nest than the southern allied species; but their general appearance is very similar, though the Himalayan nests seem to be generally rather the lightest, although the largest.

Four is the normal number of the eggs, but I have taken five.

From Nepal Mr. Hodgson notes that he "found a nest on the 6th June at Jaha-powah containing three fresh eggs; a dull verditer green, much obscured by reddish-brown freckles. The nest measured externally 6 inches in diameter, and 2·6 inches in height; the cavity was 1·5 inch in diameter and 1·6 inch in depth. The nest was in a wood, on a thick stump of a cut tree about 2 feet high, and completely hidden by the new shoots springing up from the stump. The nest was entirely composed of moss, firm and compact, and lined with hair-like fibres."

Mr. Gammie says:—"I took a nest of this species out of a large tree within reach of the ground at an elevation of about 4000 feet on the Government Cinchona plantations, Sikhim. This was on the 20th May, and the nest contained three fresh eggs. The nest was a very beautiful, finely woven cup, composed entirely of fine roots, but with a little green moss and a few dead leaves intermingled externally. No mud at all had been used in the construction of the nest. The cavity measured 3·5 inches in diameter and over 2 inches in depth, and was nowhere above an inch in thickness. The eggs were of the usual type: a delicate sea-green ground richly blotched and streaked with red and brownish red, and with a little pale purple intermingled at the larger end, where also the markings are more dense, in fact almost confluent."

Later on, he again wrote:—"This Ouzel breeds in the Darjeeling district from May to August, most commonly about the elevation of 5000 feet, near the edges of large forests. It sometimes builds in forks of trees at no great distance from the ground, but its favourite position is, at the height of 20 or 30 feet, right on the summit of a stump of a Ficus-tree, from which the Bhutias have cut the top, and pollarded for the sake of the leaves for their milch cows. The nest is kept in its place, and concealed, by the upright shoots springing away from below the stump end, and, usually, the bottom of the nest fits the end of the stem. For better concealment a little loose moss is allowed to hang a short way down the stem. A rather isolated tree is generally chosen, the bird, I suspect, objecting to the drip off lofty trees. In building, a neat compact shell is first made of twigs and moss, then a good coating of mud, and finally a thick lining of fibry roots. Externally it measures about 6 inches across, by 3·2 in height; internally the cavity is 3·5 inches in diameter by 2 in depth. The number of eggs is four."

Mr. Brooks, writing to me on 29th August, 1868, mentioned

that "before he left, Horne sent me two eggs of *Merula bouboul*. They measure 1.33 by .9 inch and 1.22 by .91 inch; ground-colour pale greenish, very thickly speckled and mottled all over (almost hiding the ground-colour) with brownish red; the markings quite confluent and darker on the large end. These two eggs are the richest coloured 'Thrushes' eggs I have ever seen. These eggs were taken at Binsar, 12 miles from Almorah, on the 8th August. I never found the nest, but Horne found several, the earliest in April. Indeed I myself shot a full-sized young one in June. Horne told me that the nest was sometimes placed on a rock-side, Ring-Ouzel-fashion, and sometimes in low trees, and was composed principally of moss and lined with grasses."

From Mahasoo, near Simla, it is recorded, I think, by Sir E. C. Buck: "June 30th. Nest on a branch of a pollard holly, 12 feet from the ground, in fork between branch and trunk, constructed externally of moss and lichen, internally lined with strong dry grass and with a layer of mud below, between external and internal layers. Eggs half-set."

Colonel C. H. T. Marshall tells us that this bird "breeds all over the Murree Hills, from middle of April till July."

Colonel G. F. L. Marshall writes:—"I have found several nests of this species ranging from 7000 feet above the sea at Naini Tal, to 4000 at Bheem Tal. They were all either wedged into forks of the larger branches of moss-covered oaks, or built against the trunk at a natural swelling, and seldom at any great elevation from the ground; the end of May and June are the chief times of breeding in this part of the country. The birds are excessively wary, except just when the young are hatched, leaving the nest long before it is approached.

"*Merula bouboul* breeds in Kumaon in June; I have found nests at elevations varying from 4000 to 7000 feet. The nest and eggs are of the usual Blackbird type, and are to be found in situations similar to those in which *M. vulgaris* breeds."

In their style of colouring the eggs most recall those of *Merula unicolor*, and are very different from those of the Nilghiri Blackbird. The ground-colour, where visible, is a pale dingy green, but is at all times thickly streaked, mottled, and clouded with dull brownish red, and in some eggs so closely as to entirely obscure the ground-colour. One egg before me is an almost uniform dull red, here and there mottled slightly paler. In another egg a good deal of the ground-colour shows through, except at the large end, where the markings form a confluent irregular cap. The eggs are slightly glossy and differ little in size from those of the European and Nilghiri Blackbird, but they appear to be less commonly pointed and more commonly obtuse ovals than those of either of these species.

In length they vary from 1.1 to 1.33 inch, and in breadth from 0.83 to 0.92 inch.

678. *Merula unicolor* (Tick.). *Tickell's Ouzel*.

Geocichla unicolor (Tick.), *Jerd. B. Ind.* i, p. 519; *Hume, Rough Draft N. & E.* no. 356.

I have never found a nest of Tickell's Ouzel; Capt. Hutton says:—"This bird arrives in the hills up to 7000 feet, and probably higher, about the end of March, the first being heard (in the year 1848) on the 26th of that month, at 5000 feet. Every morning and evening it may be heard far and near, pouring forth a short but pleasing song from the very summits of the forest trees. It is a summer visitor only, returning to the plains in early autumn. It breeds in May and June, laying three or four eggs of a dull greenish white-freckled colour, blotched and spotted with rufous, sometimes closely, sometimes widely distributed.

"The nest is neatly made of green moss and roots lined with finer roots, and placed usually against the trunk of the tree at a place whence spring one or two twigs; sometimes it is placed upon the broad surface of a thick horizontal branch or on a projecting knob. The diameter of the eggs is 1.06 by 0.8 inch, varying a little; shape sometimes ordinary oval, at others more rounded at the smaller end."

Dr. Leith Adams tells us that this "is the regular Song-Thrush of the valley of Cashmere, and is heard in every garden and grove during the breeding-season; its song resembles the Blackbird's; builds its nest in vineyards and in poplar trees around the villages; seen on the ranges around the valley, but not on the lesser ranges near the plains of the Punjab."

Mr. Brooks tells me that he obtained a nest in a pollard willow at Ramoo near Srinugger (Cashmere) on the 12th June.

From Murree, Colonel C. H. T. Marshall reports "several nests in June, made of moss and fern-stalks, lined with root-fibres. Eggs somewhat resembling those of *M. bouboul*, only smaller, rounder, and more lightly speckled. They are the same size as those of *C. cyaneus*."

Colonel G. F. L. Marshall writes:—"This is one of the commonest breeders at Naini Tal; I found two fresh eggs on the 16th May, and four fresh eggs on the 5th June, and many other nests. The nests are miniatures of the English Blackbirds' both as to structure and position, except that the cup is deeper and more moss is used in the construction. The nests found at Naini Tal are far smaller than those I have received from Murree as also are the eggs. The birds are very shy, and though I have always succeeded in obtaining the hen bird, I have only once seen a cock bird."

He gave me also a more extended account* of the nest found on the 16th May which I reproduce:—"I found this nest on the

* This note appeared in the 'Rough Draft' under the head of *Geocichla dissimilis*, Bl. (no. 356). It must undoubtedly refer to *M. unicolor*, as since noted by Mr. Hume (*S. F.* ix, p. 107).—Ed.

16th May, near Nynee Tal, on the top of the Aya-pata, at an elevation of about 7500 feet above the level of the sea, in a small shrubby tree. The nest was placed in a fork about 7 feet from the ground; it was made of moss with a few roots intertwined, small, cup-shaped, and only concealed by its likeness to a slight swelling at the fork. Rather a disreputable structure and difficult to take out, as it consisted chiefly of materials placed in the spaces between the three branches, the cavity being lined with moss."

The eggs of this species vary much in shape. Some are very round; others are a rather elongated oval; but generally there is a tendency to a pyriform shape, there being a slight compression near the small end. The ground-colour is greenish or greyish white, and the whole surface is more or less thickly streaked, or irregularly blotched with dull brownish red. In some cases the markings are comparatively few and far between, the ground-colour greatly predominating, except at the larger end: while in others the markings are so densely crowded, that the ground-colour only shows through here and there, as a pale mottling on a red ground. In all, however, the markings are densest at the large end. The eggs are a shade longer, but even less glossy than those of *Geocichla citrina*.

In some eggs the red is brighter and purpler, and some exhibit a very conspicuous zone round the large end. In some eggs the markings, with the exception of the zone at the large end, are very fine frecklings, almost speckly in their character.

In length the eggs vary from 0.92 to 1.17 inch, and in breadth from 0.7 to 0.83 inch; but the average of twenty eggs is 1.06 by 0.78 inch.

683. *Geocichla wardi* (Jerd.). *The Pied Ground-Thrush*.

Turdulus wardi (Jerd.), *Jerd. B. Ind. i*, p. 520.

Cichloselys wardii (Jerd.), *Hume, Rough Draft N. & E.* no. 357.

Of the Pied Ground-Thrush Captain Hutton writes to me from Mussoorie as follows:—"This curiously-pied Thrush arrives at Jeripanee, at 5500 feet, from the southward early in April, and is then far from rare, but retires again when the breeding-season is over. It breeds in June and July, making a pretty nest of green mosses and fibres like *Geocichla unicolor*, placed on the bifurcate branch of a tall tree, and the eggs both in size and colour might easily be mistaken for those of that bird."

Of this species Mr. Hodgson notes:—"I procured a female and nest at Jaharpowah on the 15th May. This species breeds in trees, fixing the nest in the fork of large branches; this present nest is about 6.25 inches in external diameter, and 2.5 in height; the cavity is 3.5 inches in diameter by less than 2 in depth. It is made of moss and lined with elastic, thin grass-roots, which keep it well in shape; the eggs are four in number, pale verditer, spotted with sanguine brown." The eggs as figured measure about 1.06 inch in length and 0.76 in width.

Colonel G. F. L. Marshall sends me from Nynee Tal the following interesting note :—

"On the 22nd May I found a nest of this species at an elevation of about 5000 feet above the sea. The nest, which contained four hard-set eggs, was placed about 5 feet from the ground on a stump of a bough that had been cut off, and between the twigs that had sprouted round it. The bush was in a thicket in one of the khuds close to running water. It was a compact cup-shaped structure, very similar to that of *M. unicolor*, built of moss and dead leaves and a little mud cemented together, and lined with roots. The egg-cavity was 3 inches broad by 2 inches deep. The marks on the eggs were not unlike in character to those on the eggs of *Lanius lahtora*."

The only egg I have yet seen of this species I also owe to Colonel Marshall. It is a very regular, somewhat elongated oval, only very slightly compressed towards the small end. The shell is fine, but glossless. The ground-colour very pale sea-green, blotched, spotted, and streaked, most densely at the large end (where also a number of small pale purple clouds and spots seem to underlie the primary markings), with a moderately bright, somewhat brownish red.

This egg measures 1.01 by 0.74 inch.

Two eggs subsequently obtained measured 0.99 and 0.95 inch in length by 0.72 and 0.70 inch respectively in breadth.

685. *Geocichla cyanonotus* (Jard. & S.). *The White-throated Ground-Thrush.*

Geocichla cyanotus (J. & S.), *Jerd. B. Ind. i*, p. 517; *Hume, Rough Draft N. & E.* no. 354.

Of the White-throated Ground-Thrush Dr. Jerdon states that "Mr. Ward procured the nest in North Canara, made of roots and grass, placed at no great height from the ground; and the eggs, three in number, were pale bluish, speckled with brown."

Mr. G. W. Vidal writes :—"This species is plentiful about Dapuli in the Southern Konkan. It breeds in the gardens about the station in June, July, and August. I have not myself taken the eggs of this species, but Mr. A. Jardine of Dapuli, who knows the birds well, and who at once recognized specimens in my collection, has taken a great many nests and has given me several eggs. He writes : 'The nest is made of roots, twigs, and grass, with a good deal of mud. The egg-cavity is about five and a half inches in diameter, and from two to three inches deep. The nest is generally placed in the fork of a tree low down. The highest I ever saw was about fifteen feet from the ground in a kinjal tree, but they are mostly found in mango trees. When the Thrushes have young they will not let any one go near the nest, but come flying at you, and peck like fun.' The eggs vary greatly in colour and markings, presenting two or three very distinct types."

Mr. J. Davidson, when bird-nesting on the Kondabhari Ghât, referring to the events of the 14th July, says:—"I also found a nest containing three nearly full-grown young and one addled egg of *G. cyanotis*. This Thrush is not common here, and this seems, in this part of the country, about its northern limit, and it is only a migrant arriving in the rains; it is, however, common enough along the ridge running eastward from the Ghâts immediately north of Nasik."

Mr. J. L. Darling, Jun., to whom I am indebted for the eggs of this species, has favoured me with the following note in regard to its nidification. He says:—"The first nest that I found of the White-throated Ground-Thrush I took on Kulputty Hill, in the Wynaad (Malabar), at an elevation of about 2800 feet above the sea. It was placed in a small tree, in a fork about 11 feet from the ground, precisely in the same kind of situation as our Nilghiri Blackbird would choose. The nest, too, was very like a Blackbird's—a foundation of leaves and sandy clay, the main body of the nest composed of roots, intermingled with a few twigs and a little grass, and the cavity lined with roots and slender petioles of the nelly-kai.

"This nest contained three partly-incubated eggs. The birds were very shy; I visited the nest four times before I shot the male, and six before I shot the female. Directly I approached the nest the bird noiselessly dropped on to the ground and crept away through the brushwood. When disturbing them I noticed that their call was low and sweet like that of the Blackbird when similarly disturbed.

"On the 9th I found a second nest, this time about 500 feet lower, at the foot of the hill. It was built in a loquat tree, in a fork about 22 feet from the ground, and was in every respect similar to the last except that a little moss had been used in its construction. The birds were very brave, defending their nest against one of those thieves of Crow-Pheasants, and it was the noise they made that attracted me to the nest. Again I was struck with the great similarity of their notes to those of the Blackbird when its nest is being robbed. This nest contained four perfectly fresh eggs, of which I took three, and then watched the old birds return to the nest, where they broke the one egg I had left to pieces. They have, however, begun another nest in a jack tree close by.

"Their song is never heard except in the early mornings and evenings, and mostly in the latter. They go hopping about under the coffee-trees, and scratching up and turning over the leaves in search of food."

Mr. Rhodes W. Morgan, writing from South India, says:—"It breeds in the forests of the western coast in August and September, building in small trees. The nest is composed of grass, leaves, twigs, &c., with the usual clay foundation which is found in almost all Thrushes' nests, and is lined with fine roots and hairs. The eggs are from three to four in number, of a pale greyish-blue colour,

thickly speckled with minute reddish-brown spots. The average dimensions are 0·95 inch in length by 0·77 in breadth."

The eggs strike one as rather small for the size of the bird. In shape they are moderately broad ovals, a good deal pointed towards one end. The shell is fine and fairly glossy, and some eggs have a really fine gloss.

The general character of the egg is very Meruline. The ground-colour, very little of which in some eggs is visible, is a pale bluish or greenish white, and it is thickly freckled, blotched, and streaked with more or less brownish or purplish red. The markings are usually most dense at the large end, where they often form a bold confluent cap, and at this larger end a few lilac spots are commonly intermingled with the red markings. Some eggs have all the markings fine and very thickly spread over the whole surface. Others have them thick, bold, and blotchy all over the large end half, and only a few small spots scattered over the other half, and between these two types intermediate forms occur.

The eggs measure from 0·9 to 1·08 in length, and from 0·71 to 0·79 in breadth, but the average of ten eggs is 0·99 by 0·75.

686. *Geocichla citrina* (Lath.). *The Orange-headed Ground-Thrush.*

Geocichla citrina (Lath.), *Jerd. B. Ind.* i, p. 517; *Hume, Rough Draft N. & E.* no. 355.

The Orange-headed Ground-Thrush breeds in the Himalayas from Murree to Assam, at elevations of from 1500 to 5000 feet, laying from the end of April to nearly the end of June. They build a rather broad, cup-shaped nest of moss, grass, and very fine twigs, or fir-needles, lined with fine moss-roots, and at times a little hair, measuring some 5 inches in diameter, and with a cavity about 3·5 inches broad and 1·75 deep. The nest is placed in some fork of a moderate-sized tree, in the case of all that I have seen, at no great height from the ground.

They lay three, and often four eggs, and one nest found below Kotegurh contained five.

Captain Hutton, years ago, recorded the following note in regard to this species:—"Arrives at Mussoorie at an elevation of 5000 feet about the end of May, and returns to the plains in autumn. It breeds in June, placing the nest in the forked branches of lofty trees, such as oak and wild cherry. Externally it is sometimes composed of coarse dry grasses, somewhat neatly interwoven on the sides but hanging down in long straggling ends from the bottom. Within this is a layer of green moss, and another of fine dry woody stalks of small plants, and a scanty lining at the bottom of fine roots. The eggs are three to four in number, pale greenish, freckled with rufous; the spots of that colour confluent, and forming a patch at the larger end. These are not rock-lovers at all, but true forest birds, building in trees, and taking their food

upon the ground, where they find it in berries and insects among the withered leaves, which they expertly turn over with their beaks, and hence the reason why the beak is almost invariably clothed with mud or other dirt. I have never seen these birds except in woods."

According to Mr. Hodgson's notes the Orange-headed Ground-Thrush breeds in Nepal and Sikkim in April and May up to a height of 4000 or 5000 feet. It constructs a broad saucer-shaped nest some 5.5 inches in diameter and 2.25 in depth, externally of green rock-moss, and lines it with the dry leaves of *Pinus longifolia*. The cavity is about 3 inches in diameter, and about 1.5 in depth. It is placed in some convenient fork in a tree where three or four slender sprays diverge, and it lays three or four eggs.

Mr. R. Thompson, writing from Kumaon, says:—"I have never found this bird except at 1500 to 2000 feet elevation at most. It arrives in our forests at the beginning of April, when the males begin to utter their sweet yet loud notes, and commence breeding operations."

From Murree, Colonel C. H. T. Marshall tells us that this species "builds about the beginning of June in the fork of a low tree about 6 feet up. Lays three eggs, pale greenish white, finely speckled with rufous-brown, forming a patch at the larger end, 1 inch in length, 0.8 in breadth."

From Sikkim I received two nests of this species found in July in the neighbourhood of Darjeeling. The one contained two, the other a single fresh egg. One was placed in a bamboo clump at a height of about 5 feet from the ground, between the stem and a number of radiating twigs springing from the joint. The other on the branches of a large tree at a height of about 7 feet from the ground.

A nest sent me by Mr. Mandelli, which was placed in a fork in a bamboo cluster at about five feet from the ground, is a very loose untidy nest, composed exteriorly of dead leaves, bamboo-spathes, a few twigs and pieces of decayed bamboo, all wound together with vegetable fibre. The whole of the nest is composed of much the same materials, except that interiorly there are more chips of rotten bamboo and more vegetable fibre and very little dead leaf; there is a mere pretence for a lining, a dozen or so very fine wire-like twigs being wound round at the bottom of the cavity.

This Thrush breeds in Burma, and Mr. Oates writes:—"May 22nd. Nest in a shrub in a ravine near Pegu, about four feet from the ground, made of roots and strips of soft bark, the ends of some of the latter hanging down a foot or more. The interior lined with moss and fern-roots. Interior and exterior diameters 4 and 5 inches respectively. Inside depth about 2, and bottom of nest about 1 inch thick. Contained three eggs quite fresh, measuring 1.04, 1, and 1.06 by 0.75, 0.76, and 0.79 respectively. A fourth egg found on the ground near the nest was 1.03 by 0.78.

"Another nest with three eggs was found on the 10th June."

The eggs are a broad oval, much pointed towards one end, about the size and shape of the European Water-Ouzel's egg. The ground-colour is dull greyish or greenish white, and each has a conspicuous mottled and speckled red-brown cap at the large end. The cap is not sharply defined, and beyond it specklings and minute streaks of the same colour extend more or less over the whole of the rest of the surface of the egg; in some cases ceasing entirely, in others diminishing in frequency as they approach the smaller end.

Some of the eggs of this species have a very fine gloss, and most of them are fairly glossy. In some the markings are brighter and redder, in others duller and browner. Dull purple markings are generally intermingled in the cap, and though this is generally at the larger end I have one egg in which it is at the smaller end.

In length the eggs vary from 0.82 to 1.1 inch, and in breadth from 0.7 to 0.82 inch; but the average of a dozen eggs is 0.99 by 0.77 inch.

690. *Petrophila erythrogaster* (Vigors). *The Chestnut-bellied Rock-Thrush.*

Orocetes erythrogastra (Vig.), *Jerd. B. Ind.* i, p. 514.

Petrophila erythrogaster (Vig.), *Hume, Rough Draft N. & E.* no. 352.

I have only once seen the nest of the Chestnut-bellied Rock-Thrush, and that was at the end of May, above Jatingere, towards the Bubboo Pass from Kangra into Kooloo. It was placed at the root of a tree in a forest, and was a large shallow saucer, composed almost entirely of moss and lined with moss-roots; a few dead leaves were intermingled at the base of the nest. It measured about 6 inches across, but I ascertained no particulars, for, having gently caught the female on the nest with my hand and lifted her, I found four chicks just out or struggling out of the shells, and so put her back again on the nest, where she sat immovably with her little head on one side, watching me with her bright dark eye, but apparently satisfied that I was up to no mischief.

Mr. R. Thompson says that "in Kumaon they lay in June and July, making a circular nest of mosses, twigs, and small roots, some 6 inches in diameter, on the ground, under a rock or stump, or in a hole. They affect northern well-wooded slopes from 6000 feet upwards."

At Dhurumsala, Captain Cock obtained a nest on the 20th May containing three fresh eggs, which varied in length from 0.9 to 0.95 inch; they were all 0.7 inch in breadth. These eggs were very small, judging from the few I have seen and measured; 1 by $\frac{3}{4}$ inch is the average size.

In Nepal, according to Mr. Hodgson's notes, "this species begins to lay during April. It builds a large shallow circular nest on ledges of rocks, composed of grass-stems and moss, and lined with fine roots. One such nest measured exteriorly 8 inches in diameter

and 2.25 in height, while the cavity was 3.5 inches in diameter and 1.5 inch in depth. They lay four somewhat buff-coloured eggs; one measured about 1.1 by 0.75 inch. They breed only once a year."

Colonel G. F. L. Marshall writes:—"This bird is very common at Naini Tal, and I have often watched it feeding its young, but never till this year have I been up early enough in the season to find the nest. On the 29th April I observed a male bird with a large grub in his mouth. I watched him with binoculars, and after a few feints he dived suddenly into the bank overhanging the road, about 70 yards off on the other side of the valley, emerging shortly afterwards empty-beaked. In a few minutes the female appeared, also with a grub in her mouth, but instead of going to the nest she watched me anxiously for a few moments, then notwithstanding the long distance I was away, fear got the better of her and she flew off in the opposite direction. The nest contained four half-fledged young; it was in a sort of cleft in the bank, about seven feet above the road; the bottom of the cleft projected beyond the top of it, or rather the top receded; the nest was invisible from below. The nest was not large, neatly made of moss and lined with a little fine grass and a few roots. It was just far enough into the cleft to be protected from rain. In the course of the next few days I found three other nests all with the young just fledged. My experience as to the time of breeding accords with Mr. Hodgson's, and making allowance for the later summer in the western Himalayas, it accords with that of Mr. Hume and Captain Cock. I think Mr. Thompson must have made a mistake on this point, more especially as he gives no details, but confines himself to general remarks."

691. *Petrophila cinclorhyncha* (Vigors). *The Blue-headed Rock-Thrush.*

Orocetes cinclorhynchus (Vig.), *Jerd. B. Ind.* i, p. 515.

Petrophila cinclorhynchus (Vig.), *Hume, Rough Draft N. & E.* no. 353.

The Blue-headed Rock-Thrush breeds throughout the Himalayas from Darjeeling to Murree, at elevations of from 4000 to about 8000 feet. It lays during the last week in April, May, and part of June. The nest is placed at the roots of trees, in holes in banks, and at the base of trees, or in hollows in banks overhung by tufts of grass or weeds. The nest is a rather shallow cup, neatly made of moss, grass, fir-needles, and dead leaves, and lined with fine roots or a little hair, the materials varying according to the taste of the individual bird or perhaps according to locality. It measures externally from 4 to 5 inches in diameter and 2½ to 3 inches in height, and has a neat, nearly hemispherical cavity, some 3 inches wide by 1.5 in depth. The eggs are four in number.

Writing from Murree, Colonel C. H. T. Marshall says:—"Builds in banks under roots or tufts of grass a neat cup-shaped nest.

The eggs are salmon-coloured, with a few darker red specks and spots. The nests we found were made entirely of dead pine-leaves beautifully woven together. Elevation 6000 feet."

Colonel G. F. L. Marshall writes:—"A nest with half-fledged found at Naini Tal on the 3rd June was in a hole at the root of a tree on a grassy slope close to a frequented road, from which it was quite visible. The male bird was sitting. I could not see the lining, as the young birds concealed it; but the outer part seemed roughly built of moss, and cup-shaped."

Mr. W. E. Brooks has recorded the following:—"On the 26th of May I shot a female of this species at Almorah, and close to where she fell was a nest in a hole of an old retaining wall, overgrown with grass. For hours the place was watched, but no bird came near the partly-incubated eggs. Her breast was bare, as if she had been sitting on eggs. The male I had also shot shortly before the female. The nest was very Thrush-like in form, and was placed in just such a situation as would have been chosen by a Ring-Ouzel. It was composed of fine twigs, roots, and coarse grass, and lined with finer grass. The eggs were four in number, 0.91 by 0.62 inch, of a pale buff or salmon-colour, finely mottled, principally at the larger end, with very pale reddish brown. Though they are not Thrush-like in colouring, being more like those of a Redbreast, I cannot believe that they belong to any other bird."

I may note that I have one of the eggs thus found, and that there is no possible doubt that it belongs to this species, of which I have now taken very many.

Mr. R. Thompson remarks:—"In June 1865 I found a nest close to my house at Koorpatal, below Nynce Tal, with only one young one. For the last two years the same pair have constantly bred in the same place, making a fresh nest each year and bringing up two and three young ones. This year the three young ones remained with the parent birds for a considerable time. Many young ones are taken at Almorah, where the natives prize them for their song. They lay in May and June, building a circular cup-shaped nest some 4.8 inches in diameter, composed externally of mosses and roots, internally of hairs and fine fibres, on the ground, in a hole, either under a stump, a tuft of grass, or a stone. They generally breed at elevations between 3000 and 6000 feet."

Captain Cook long ago sent me the following note from Dhurumsala:—"Nidificates in May and June in the North-west Himalayas. Nest is composed of moss at the bottom, with layers of coarse grass, fibres and roots, internally of finer grass-fibre; but it is a loosely-put-together affair, and with a little handling soon comes to pieces. It is a saucer-shaped open nest, 4 inches in diameter, generally placed on some bank by the side of a road. Parent bird fearless, sometimes choosing a very much frequented road, but still their nests are well concealed in some little niche of the bank. The parent bird may be caught by the hand when on her eggs. Lays four eggs, salmon-colour or buff (caused by the numerous

small spots confluent over them), usually darker towards the larger end."

Major Wardlaw Ramsay says, writing of Afghanistan:—"It was, I think, breeding in June."

The eggs appear to vary little in size or shape. They are rather long ovals, very blunt at the small end, and having a slight gloss. In colour and character they recall the eggs of *Stoparola* and *Niltava*. Looked at from a distance the general hue of the egg is either a pale brownish pink or a dingy buff, darkest towards the large end. Closely looked into, the general tint proves to result from a pinkish-white ground very closely and minutely freckled and mottled all over (but most densely at the large end) with pale, dingy brownish, salmon-colour, or reddish brown; the colour, indeed, is so ill-defined that it is difficult to say what it is. The eggs have a slight gloss. They vary in length from 0.87 to 0.99 inch, and in breadth from 0.68 to 0.79; but the average of twenty eggs is a little over 0.92 by 0.72.

693. *Petrophila cyana* (Linn.). *The Western Blue Rock-Thrush.*

Petrocossyphus cyaneus (Linn.), *Jerd. B. Ind. i*, p. 511.

Cyanocinclæ * *cyaneus* (Linn.), *Hume, Rough Draft N. & E.* no. 351.

Colonel C. H. T. Marshall, writing from Murree, remarks:—"The eggs of the Blue Rock-Thrush have not, we think, been recorded before from India. There is a description of them in Sharpe and Dresser's 'Birds of Europe.' We found the nest in a low stone wall at no great elevation; it contained four eggs, very pale blue, with a few small brown specks on them. The eggs are 1.1 inch in length and 0.75 inch in breadth, and were taken early in June."

One of these eggs, sent me by Colonel Marshall, is excessively small for the size of the bird, very much smaller than the egg of *M. saxatilis*, but there is, I think, no possible doubt of its authenticity, and it corresponds fairly with eggs collected in Greece by Dr. Krüper on the 8th June, 1862. The egg is very smooth and has a fine gloss. The ground-colour is an excessively pale, slightly greenish, blue, and it is pretty closely speckled at the large end with very minute brownish-red spots; a few similar specks are sparsely scattered over the rest of the surface of the egg. It was taken on the 7th June, and measures 1 by 0.73 inch. Two other eggs subsequently taken at Murree measured 1.15 and 1.1 in length by 0.78 and 0.75 in breadth.

Major Wardlaw Ramsay says, writing of Afghanistan:—"A few

* In the Rough Draft, Mr. Hume proposed the generic term *Cyanocinclæ* for this species and *P. solitaria*. These two birds, however, appear to me to be congeneric with *Petrophila cinclorhyncha*, the type of the genus *Petrophila*

pairs remained throughout the summer, and doubtless were breeding; but I did not find the nest."

695. *Turdus viscivorus*, Linn. *The Missel-Thrush.*

Turdus hodgsoni, Lafr., *Jerd. B. Ind.* i, p. 531; *Hume, Rough Draft N. & E.* no. 368.

I, as yet, only know of the Missel-Thrush breeding in the valleys of the Beas and Sutlej, at elevations of from 6000 to 8000 feet. I have only taken one nest myself, but have had several sent me, and I find by my notes that the earliest was taken on the 6th April, the latest on the 22nd of June. The nests are large deep cups, very like those of the Blackbird's, always placed, as far as my experience and information goes, in forks of trees, at no great elevation from the ground. The core is composed of clay and grass-stems, founded on a lot of dry leaves, fern, &c.; externally there is a very thick coating of moss, grass, and lichen, while internally there is a thick lining of soft grass. The nest I obtained above Juggut Sook, in the valley of the Beas, measured *in situ* 8 inches in diameter and nearly 6 inches in height externally.

The cavity was 4 inches in diameter and nearly 3 deep.

Major Wardlaw Ramsay says, writing of Afghanistan:—"On the 22nd May I found a nest containing four young birds nearly fledged. The nest was situated in a small deodar, about 4 feet from the ground, and seemed in every respect like that of a Blackbird in England. I returned a few days after to the spot, but found the nest gone; it had been taken by a soldier, in whose possession I found it afterwards. He kept the young birds for about a fortnight, when they died. I, however, was able to determine the species for certain."

The eggs, which I have now repeatedly received from near Kotagurh and higher up in the valley of the Sutlej, are moderately broad ovals, somewhat obtuse at both ends, and exhibit but little gloss. The ground-colour varies from pale pink to a pale greenish grey, or even very pale green, and they are moderately thickly speckled and spotted (most densely, as a rule, towards the larger end) with primary markings of brownish red and secondary ones of pale purplish pink, which often seem to underlie the surface of the egg. In some cases the brownish-red spots are so deep and intense that they almost look as if they were black, but it is only occasional spots and never the whole body of them that assume this deep tint.

In length they vary from 1.17 to 1.26 inch, and in breadth from 0.88 to 0.93 inch; but the average of twenty eggs is 1.21 by a little more than 0.9 inch.

698. *Oreocincla dauma* (Lath.). *The Small-billed Mountain-Thrush.*

Oreocincla dauma (Lath.), *Jerd. B. Ind. i*, p. 533; *Hume, Rough Draft N. & E.* no. 371.

Captain Cock * took a nest of the Small-billed Mountain-Thrush at Gulmerg in Cashmere on the 6th June, 1871.

Colonel C. H. T. Marshall writes that he has received the eggs of this species taken by Captain Cock at Doongagully near Murree; the nest was found on the 18th of May, 1876, and contained two fresh eggs; their colouring corresponds exactly with the description already given in 'Nests and Eggs.' Length 1.38 by 0.94.

Colonel G. F. L. Marshall remarks:—"A nest found on the 29th May, 1875, at Naini Tal, about 7000 feet above the sea, contained three eggs. In shape it was a wide cup, not deep, built of moss rather substantially, and neatly lined with stalks of maiden-hair fern still bearing a few of their leaves and a few bents of grass; its position was in the fork of a moss-covered rhododendron; it was about 20 feet from the ground, and beautifully concealed; the tree overhung a little-frequented road in dense forest. The bird was so excessively shy that I secured it with difficulty. They are rather common at Naini Tal, and have a pleasant song not unlike that of *Geocichla walli*.

"The description of the eggs by Mr. Hume exactly answers to those I took."

The eggs are broad ovals, somewhat compressed and pointed towards the small end; they have a slight gloss, and remind one somewhat of those of the *Myiophonus* group. The ground-colour is a pale greenish white (entirely obscured in some specimens by the markings), very minutely and densely freckled and mottled with pale brownish, or in some cases reddish purple. The markings are indistinct and clouded, and in some eggs form a small ill-defined brighter patch or cap at the large end. Some eggs show the ground pretty distinctly; others, looked at from a little distance, appear to be a sort of mottled, dull, reddish buff throughout.

In length the eggs (only three measured) varied from 1.2 to 1.26 inch, and in breadth from 0.9 to 0.93 inch.

699. *Oreocincla nilghiriensis*, Blyth. *The Nilghiri Thrush.*

Oreocincla nilghiriensis, Blyth, *Jerd. B. Ind. i*, p. 534; *Hume, Cat.* no. 372.

Mr. Rhodes W. Morgan, writing from South India, says:—"This handsome Thrush breeds from March to June on the

* Mr. Brooks appears, however, to claim the discovery of this nest, see S. F. iii, p. 237, and Mr. Hume's note thereon.—Ed.

Neilgherries, almost invariably on some low tree, some 6 or 8 feet from the ground. The nest is very like that of *Merula similima*, and usually contains three eggs, of a pale greenish-blue colour, minutely speckled with rusty brown. They average in size 1.21 inch in length by 0.82 in breadth. This Thrush may usually be seen seated on the topmost branch of some large shola-tree late in the evening. It utters every now and then a single clear warbling note, but appears to have no song."

Captain Horace Terry remarks:—"On the 7th June, 1883, I obtained a nest with two fresh eggs and the female bird at Kodikanal. Nest placed in fork of tree in a thick shola about 15 feet from the ground, composed of green moss lined with fine roots, with some fern mixed up in the foundation. A large shallow cup, compactly put together, 3.75 inches across and 1.75 inches deep inside, 6 inches across and 3 inches deep outside. Eggs rather peg-top in shape, and in colour much the same as an ordinary Jay's."

701. *Oreocincla mollissima* * (Blyth). *The Plain-backed Mountain-Thrush.*

Oreocincla mollissima (Bl.), *Jerd. B. Ind.* i, p. 533; *Hume, Cat.* no. 370.

The nest of this species is a most lovely one. It is a deep, large, massive cup, composed entirely of beautiful green moss firmly felted together, the cavity thinly lined with extremely fine black fern- and moss-roots. Externally the nest is about 5.5 inches in diameter and 3.3 in height; the cavity is 3.5 in diameter and 2 in depth.

The eggs are elongated ovals, sometimes excessively elongated, generally rather obtuse at both ends, occasionally pyriformed. The shell is fine and close-textured, but seems usually to have but little gloss. The ground-colour is a nearly dead white. The markings, very densely set about the large end, where they are nearly confluent and fairly thickly set everywhere else, consist mainly of specks, spots, and moderate-sized and irregular blotches of two shades of red—one more of blood, the other browner or yellower. Intermingled with these are a few specks, spots, and clouds of pale purple.

These eggs, brought from Native Sikkim about the end of June, vary in length from 1.27 to 1.42, in breadth from 0.84 to 0.90, the average being 1.35 by 0.88.

* The following note is incomplete, and the remainder of the manuscript has apparently been lost.—Ed.

703. *Oreocincla spiloptera*, Blyth. *The Spotted-wing Thrush.**Oreocincla spiloptera*, Blyth, *Hume, Cat. no. 372 ter.*

Colonel Legge, writing from Ceylon, remarks of the breeding of this Thrush:—"In January 1873 I discovered the Spotted-wing Thrush in the low country forests of the Trincomalie District, at an elevation of not more than 300 feet above the sea-level, the bird never having been before recorded from any part of the island but the Central and Southern Province hills. At the same time I found its nest in the fork of a straight sapling about 4 feet from the ground. The structure was very similar to that of the European Blackbird, but not so massive; it was composed of small twigs and lined with grass, and was a deep cup in shape. It contained two eggs, which, though I frightened the bird off the tree, were quite fresh, and I therefore am inclined to the belief that, though they were warm, the clutch was as yet incomplete. The eggs were of a bluish-green ground-colour, freckled all over with light and reddish grey, with some lilac-grey specks, and measured 1·19 inches by 0·79. The spottings are somewhat confluent at the obtuse end."

He subsequently remarked, in his 'History of the Birds of Ceylon':—"The breeding-season extends over the first half of the year. The nest is placed in the fork of a sapling a few feet from the ground, or among the roots of a tree on a bank or little eminence, and is a loose-looking, though compactly put together structure of small twigs, roots, moss, and grass lined with finer materials of the same, the egg-cavity being a deep cup, tolerably neatly finished off. . . . The eggs measure from 1·06 to 1·17 in length by 0·74 to 0·77 in breadth."

705. *Zoothera marginata*, Blyth. *The Lesser Brown Thrush.**Zoothera marginata*, Bl., *Hume, Rough Draft N. & E. no. 350 bis.*

Dr. Jerdon tells us that he obtained the egg of the Lesser Brown Thrush, and that it was "like that of *Pitta*, white, with a few rusty-brown spots."

From Sikhim Mr. Gammie writes:—"I took one nest of this Thrush on the last day of May, in a large forest at about 5000 feet elevation. It was placed about 10 feet from the ground on a moss-covered leaning stem of a shrub which overhung a small stream in a densely-shaded dell. The nest had only the stem (which was not thicker than a child's wrist) and a slender dead twig to support it. It was a compact, rather massive cup, made of living moss, thickly lined with black fibrous roots, and without any mud. Externally it measured 5 inches across by 3·5 in height; internally the diameter was 3·25 and the depth 1·9 inches.

"The eggs were partially incubated, and three in number."

A nest of this species sent me by Mr. Mandelli was found in

Native Sikkim below Yendong on the 29th July, and was placed in the fork of a slender tree at a height of about 8 feet from the ground. The nest is an extremely regular massive cup, composed entirely of green moss felted together very closely, and thickly lined with fine black and brown roots. Its exterior diameter is 5 inches, its height 2·5; the cavity is about 3 inches in diameter, and about 1·25 in depth.

A single egg of this species sent me by Mr. Gammie is a moderately elongated oval, with a pretty compact but almost entirely glossless shell. The ground-colour is a very pale greenish white. It is very richly blotched, splashed, streaked, and spotted with a ferruginous brown, and besides this the whole of the larger end is mottled with pale dull pinky purple. At the large end the markings are nearly confluent; over the rest of the surface of the egg they are for the most part bold, but thinly set.

The egg measures 1·05 by 0·79.

An egg of this species, however, obtained by Mr. Mandelli near Darjeeling on the 29th of July is rather of the Blackbird type. The egg is a moderately broad oval, a good deal pointed towards the small end. The shell has only a faint gloss, whereas all the Pittas have very round and very glossy eggs. The ground-colour is a pale greenish white; about the small end is a dense cap of blotches, clouds, and spots of brownish red intermingled with purple, and small spots, specks, and streaks almost exclusively of the former colour are scattered about the rest of the surface of the egg.

The egg measures 1·06 by 0·82.

706. *Cochoa purpurea*, Hodgs. *The Purple Thrush.*

Cochoa purpurea, Hodgs., *Jerd. B. Ind.* ii, p. 243; *Hume, Rough Draft N. & E.* no. 607.

We have no very certain record of the nidification of the Purple Thrush; it is no doubt not uncommon in Kumaon, indeed is common about Binsur, and there the late Mr. Horne, C.S., took a nest probably of this species. I do not myself feel certain about the matter. Mr. Horne was no ornithologist, and but little of an oologist; but Mr. Brooks was, I think, satisfied, and I quote what he wrote to me at the time:—

“The egg of *Cochoa purpurea* in colouring *exactly* resembles that of *Merula boulboul*; but is rather smaller, being 1·2 by 0·88. Horne thought the bird was the female of *Orocetes erythrogaster*, but I have the female shot off the nest, and the nest, too, differs in mode of lining from that of *M. boulboul*. I transcribe Horne’s note about it:—

“Nest very solid, of moss, built on a horizontal bough, 10 or 12 feet from the ground, in a small tree in a ravine near the top of Binsur. Interior nearly a true cup lined with white lichens, fine moss, and principally black roots (very fine). The bird sits very

close, but only laid one egg in nine days. I sent for the nest thinking there would have been four eggs, one having been in the nest when I found it nine days since, but there were only two. The eggs very nearly resemble those of *Merula bouboul*, being, however, a little smaller: ground greenish, thickly blotched with brown. They vary very much in proportion of colour.*

"The only question is this—Was Horne close enough to know the bird again when shot? He was close to it, and at 40 yards the bird could not be mistaken for any other: it is so well marked—the grey-blue head makes such a contrast with the brown body. He sent for the nest and his man shot the bird therefrom; if he missed the *Cochoa* he might have contented himself with a female *Merula bouboul* (although to find a female *M. bouboul* when wanted would not be easy, for they are nearly as scarce as the *Cochoa* there), but he brought a *Cochoa*; the nest, moreover, was not that of *M. bouboul*."

I venture to submit that perhaps he missed the *M. bouboul*, and then meeting a *Cochoa* shot it as about the right size of bird*.

707. *Cochoa viridis*, Hodgs. *The Green Thrush.*

Cochoa viridis, Hodgs., *Jerd. B. Ind.* ii, p. 243; *Hume, Rough Draft N. & E.* no. 608.

Of the nidification of the Green Thrush I possess no very certain information, but what I have certainly tends to corroborate Mr. Horne's account of the nidification of the Purple Thrush.

A nest said to belong to the present species was sent me from Native Sikhim, where it was found in June. It was found at an elevation of about 10,000 feet, and was placed on the branch of a large tree at about 8 feet from the ground. It contained three partially incubated eggs, two of which were accidentally broken. The nest was a large Thrush-like nest, but only the lining was sent to me, which consisted of a thick exterior coating of roots, and an interior one of the feathery, grey, beard-like lichen so commonly seen hanging from the branches of trees in the hills.

The egg is a very regular, moderately elongated oval; the shell fine and with a fair amount of gloss.

The ground-colour a very pale, somewhat greyish green, everywhere thickly, but very finely, freckled and mottled with dull, rather pale brownish and purplish red. The markings are most dense at the large end, where they form an inconspicuous, irregular, speckly, or freckled cap.

The egg is very *Meruline* in its character, and measures 1.03 in length by 0.75 in width.

Nests of this species found in Native Sikhim in June, at elevations of 9000 to 10,000 feet, are large shallow cups, composed of

* There can be little doubt, now that we know the history of these Thrushes better, that the nest really belonged to *C. purpurea*.—Ed.

fine twigs or roots wound round and round, rather neatly intermingled with a few tendrils of creepers and more or less entirely coated externally with moss and selaginella, and in some cases with a few dry leaves also incorporated in the lower surface. All contained two or three eggs, and were placed on branches of large trees at heights of from 10 to 20 feet from the ground. In one, there is a lining at the bottom of the cavity composed of the old man's beard lichen firmly matted together. The nests vary in size from 5 to 7 inches in diameter and 2 to 3 inches in height, according to the amount and extent of the mossy outer covering; the cavity may be about 3.5 inches in diameter and 1 to 2 in depth.

Subfamily CINCLINÆ.

709. *Cinclus asiaticus*, Swains. *The Brown Dipper*.

Hydrobata asiatica (Swains.), *Jerd. B. Ind.* i, p. 506; *Hume, Rough Draft N. & E.* no. 347.

The Brown Dipper, or Water-Ouzel, breeds in all the lower stream-traversed valleys of the Himalayas, from Darjeeling to Cashmir, from almost the level of the plains up to about 6000 feet. I cannot learn that they breed higher than this, though during the summer they may be found at great elevations.

Mr. W. T. Blanford correctly remarks:—"This species ranges, in the summer, as high as 12,000 feet at least, and I have a specimen shot at that elevation at Yeomalong in the Lachung Valley. I saw brown birds which I noted at the time as belonging to this species up to 14,000 feet, and I believe they were correctly identified, but as I secured none, they may have been *C. sordida*. Towards the end of October, I saw this Dipper in the great Rangit River, not 1000 feet above the sea."

This Dipper lays at very different periods, according perhaps to season and elevation. I took a nest in an affluent of the Sutlej above Kotegurh, at an elevation of something over 5000 feet, in the first week of May. I took two nests in Mandi below Drung, at an elevation of perhaps 3000 feet, on the 21st April. Captain Cock took two nests on the 12th and 20th March near Dhurumsala, at an elevation of about 4000 feet; but they lay earlier also, as Captain Hutton wrote to me that "on 21st December we found a pair employed in preparing a nest at Rajpore; they had selected a hole in a rock over which fell a rapid stream serving as a screen. On the 4th of January visited the spot, and found the nest completed, but no eggs laid. On the 12th January again visited it and found one egg only, but did not see its colour. On the 18th again visited the spot and found three eggs, but did not dare to take them out. A few days afterwards sent a man to take the nest, and found that some rascal had carried off the eggs."

The nests that I found in Mandee were large balls of moss, some 7 inches in diameter, wedged into clefts of moss- and fern-covered rocks—the one, half under a little cascade, the other about a foot above the water's edge in the side of a rock standing in the midst of a broad deep stream. Each nest had a circular aperture in front, about 2·5 inches in diameter; the cavity was about 4 inches in diameter, lined with moss-roots in the one nest, and with these and a few dry leaves in the other. Each contained five eggs. Other nests that I have seen were huge globular masses of interwoven moss, nearly a foot in diameter and fully 8 inches high, something like a gigantic Wren's nest, with a neatly worked circular aperture on one side and an internal cavity, about 4·5 inches in diameter and 3 inches high, lined with dry leaves and fern and fine moss-roots. I have never known more than five eggs in a nest.

Colonel J. Biddulph remarks that this Dipper is "very common" in Gilgit. "Appears to breed early in March, as full-fledged young were about in the middle of April."

The eggs which I have obtained, not only from Mandee, but also from the neighbourhood of Simla, Almora, Dhurumsala, and Mussoorie, are, as a rule, somewhat elongated ovals and pure white in colour, very similar to, but smaller and more elongated than, the majority of eggs of the common European Dipper. The eggs are very soft and satiny in texture, but have very little real gloss.

Most of the eggs are much pointed towards the small end, but pyriform and obtuse-ended varieties occur. The eggs remind one more of those of the Barbets than of those of the true Thrushes.

In length they vary from 0·9 to 1·08 inch, and in breadth from 0·65 to 0·79 inch; but the average of twenty-two eggs measured is a trifle more than 1·0 by 0·72 inch.

Subfamily ACCENTORINÆ.

718. *Tharrhaleus strophiatatus* (Hodgs.). *The Rufous-breasted Accentor*.

Accentor strophiatatus, *Hodgs., Jerd. B. Ind.* ii, p. 287; *Hume, Rough Draft N. & E.* no. 654.

The Rufous-breasted Accentor breeds, according to Mr. Hodgson, from May to August, on the high naked ranges of the Himalayas, in Sikhim and Nepal. The nest is placed upon the ground, amongst tufts of sunputti grass, and is composed of grass-roots and moss lined with sheep's wool and the hairs of yaks. The nest is a hollow cup; one measured externally 4·12 in diameter and 2·5 in height; the cavity was 2·62 in diameter and 1·5 in depth. They lay three or four eggs, regular ovals, pure, pale, spotless sky-blue, measuring about 0·74 by 0·54.

719. *Tharrhaleus jerdoni* (Brooks).

Accentor jerdoni, Brooks, *Hume, Rough Draft N. & E.* no. 654 bis.

Mr. Brooks obtained a nest and eggs of this species on the 6th June at Sonamerg in Cashmere.

He says :—"Captain Cock says that *Accentor jerdoni* is 'common at Sonamerg in Cashmere. It makes a neat cup nest in the lower boughs of some pine tree in June, and lays four beautiful blue eggs.

"The nest is a deep cup, constructed of grass, pine-needles, and roots, and is placed on the upper surface of one of the lower boughs of the pine. The eggs are rather long ovals and sky-blue."

Colonel Biddulph remarks :—"Common in the summer at Gilgit at elevations of 10,000 feet and upwards, where it breeds."

The eggs are very regular, somewhat elongated ovals, some only slightly pointed towards the lesser end, others a good deal compressed there.

They are of a rather more elongated form than those of *Tharrhaleus modularis*, but are of similar shape to the figure of *Accentor alpinus* in Hewitson's work; the texture is smooth. The egg is without spots and of a pure bluish green, the same tint as is exhibited in the illustration of the *Accentor's* eggs in the above work. There is no gloss upon the egg.

Seven eggs varied from 0·72 to 0·77 inch in length, and from 0·53 to 0·57 in breadth.

Family PLOCEIDÆ.

Subfamily PLOCEINÆ.

720. *Ploceus baya*, Blyth. *The Baya*.

Ploceus baya, Bl., *Jerd. B. Ind.* ii, p. 343 (part.); *Hume, Rough Draft N. & E.* no. 694 (part.).

So much has been written about the nidification of the Baya, that I need scarcely add to the existing literature of the subject. I will first quote Dr. Jerdon's most admirable account*.

Dr. Jerdon says :—"The Baya breeds during the rains, according to locality, from April to September, but I am not aware if they have more than one brood. Its long retort-shaped nest is familiar to

* Dr. Jerdon's account really refers to two distinct species, *P. baya* and *P. megarhynchos*, which were at one time confounded together; but the nesting-habits of these two species do not appear to differ in any respect, except perhaps in the situation of the nest, the Burmese bird frequently selecting the eaves of houses, whereas *P. baya* apparently never does this.—Ed.

all, and it is indeed a marvel of skill, as elegant in its form as substantial in its structure, and weatherproof against the downpour of a Malabar or Burmese monsoon.

"It is very often suspended from the fronds of some lofty palm tree, either the palmyra, cocoanut, or date, but by no means so universally as Mr. Blyth would imply; for a babool or other tree will often be selected in preference to a palm growing close by, as I have seen within a few miles from Calcutta on the banks of the canal. Very often a tree overhanging a river or tank, or even a large well, is chosen, especially, as Tickell says, if it have spreading branches and scanty foliage. In India I have never seen the Baya suspend its nest except on trees, but in some parts of Burma, and more particularly in Rangoon, the Bayas usually select the thatch of a bungalow to suspend their nests from, regardless of the inhabitants within. In the cantonment of Rangoon very many bungalows may be seen with twenty, thirty, or more of these long nests hanging from the end of the thatched roof; at one house in which I was an inmate a small colony commenced their labours towards the end of April, and in August, when I revisited that station, there were above one hundred nests attached all round the house! In India, in some localities, they appear to evince a partiality to the neighbourhood of villages and dwellings; in other places they nidificate in the most retired spots in the jungle, or in a solitary tree in the midst of some large patch of rice cultivation.

"The nest is frequently made of grass of different kinds plucked when green, sometimes of strips of plantain-leaf, and not unfrequently of strips from the leaves of the date-palm or cocoanut; and I have observed that nests made of this last material are smaller and less bulky than those made with grass, as if the little architects were quite aware that with such strong fibre a less amount of material was necessary. The nest varies much in the length both of the upper part or support, and the lower tube or entrance; the support is generally solid from the point whence it is hung for 2 or 3 inches, but varies much both in length and strength. When the structure has advanced to the spot where the birds have determined the egg compartment to be, a strong transverse loop is formed, not in the exact centre but a little at one side. If then taken from the tree and reversed, the nest has the appearance of a basket with its handle, but less so in this than in the next two species, which have seldom any length of support above. Various authors, &c., described this loop or bar as peculiar to the male or setting nest, whereas it exists primarily in all, and is simply the point of separation between the real nest and the tubular entrance, and being used as a perch both by the old birds and the young (when grown sufficiently) requires to be very strong. Up to this time both sexes have worked indiscriminately; but when this loop is completed, the female takes up her seat on it, leaving the cock bird to fetch more fibre and work from the outside of the nest whilst she works on the inside, drawing in the fibres
g^e

pushed through by the male, and re-inserting them in their proper place and smoothing all carefully. Considerable time is spent in completing this part of the nest, the egg-chamber being formed on one side of the loop, and the tubular entrance on the other, after which there appears to be an interval of rest. It is at this stage of the work, from the formation of the loop to the time that the egg-compartment is ready, that the lumps of clay are stuck on about which there are so many conflicting theories. The original notion, derived entirely, I believe, from the natives, was that the clay was used to stick fire-flies on to light up the apartment at night. Layard suggests that the bird uses it to sharpen its bill on; Burgess that it serves to strengthen the nest. I, of course, quite disbelieve the fire-fly story, and doubt the other two suggestions. From an observation of several nests, the times at which the clay was placed in the nests, and the position occupied, I am inclined to think that it is used to balance the nest correctly, and to prevent its being blown about by the wind. In one nest recently examined there was about 3 ounces of clay in six different patches. It is generally believed that the unfinished nests are built by the male for his own special behoof, and that the pieces of clay are more commonly found in it than in the complete nests. I did not find this the case at Rangoon, where my opportunities of observing the bird were good, and believe rather that the unfinished nests are either rejected from some imperfect construction, weak support, or other reason, if built early in the breeding-season, or if late that they are simply the efforts of that constructive faculty which appears at this season to have such a powerful effect on this little bird, and which causes some of them to go on building the long tubular entrance long after the hen is seated on her eggs.

"I have generally found that the Baya lays only two eggs, which are long, cylindrical, and pure white; but other observers record a larger number. Sundevall states that he found three in one nest; Layard says from two to four; Burgess six to eight; Tickell six to ten. Blyth thinks that four or five is the most usual number. From my observations I consider two to be the usual number, but have found three occasionally. In those exceptional instances where six or more eggs have been found, I imagine they must have been the produce of more than one bird. The Baya is stated not to use the same nest for two years consecutively, and this I can quite understand without having actually observed it."

I can entirely endorse this excellent account, and I would only add that sometimes in Southern India they construct the nest entirely of coir, these being the handsomest nests made by this species. With Dr. Jerdon I am perfectly convinced that two is the normal number of eggs. I have certainly examined a hundred nests and never found more than three, and only two or three times more than two. The majority of the birds lay, I believe, everywhere in August; though Dr. Jerdon does not state it explicitly, it is, I believe, a fact that this bird *always* breeds in

society. I have never found less than ten nests together, and often of course there are more than ten times that number.

The same nests are at times used during a second season. I have myself once or twice seen birds busy patching up old nests (the difference in the colour of the fresh grass being conspicuous), whilst others were building new ones on the same tree. Whether the same or a different colony return to do this I cannot say.

In very fine nests of the ordinary type the tapering suspensory portion will reach one foot in length. The bulb will be 7 inches in length and about $5\frac{1}{2}$ inches in diameter one way and 4 inches the other, while the long tubular entrance that the male often goes on building after the female is sitting reaches in one specimen I have preserved to a length of 11 inches, with a diameter of barely 2 inches; and how the birds shoot perpendicularly up these with closed wings as easily as they do without running their heads through the top of the bulb with the impetus they have acquired, and without even (apparently) shaking the nest, is marvellous. As a rule these entrance passages do not exceed 6 inches in length.

The birds sit very close. One day driving out during the rains at Mynpooree, my eye was caught by a particularly fine nest hanging amongst some twenty others in a keekur tree. I made one of my people climb the tree and bring the nest carefully down, cutting the slender twig from which it was suspended. The nest was laid at the bottom of my waggonette, and on our arrival at home hung from one of the antlers of the many stags' horns that in those days adorned my dining-room. Three days later we became aware of a very unpleasant odour; it was traced to this nest after some search, and on taking it down I found to my horror a female Baya dead upon two dead half-hatched chicks. There are not many birds that would have thus stuck to their nests and died on their eggs sooner than leave them.

The late Mr. Horne recorded an interesting note on the breeding of this species which I also quote:—"This morning (July 7th, 1865), as I passed our solitary palm-tree (*Phoenix dactylifera*) in the field, I heard a strange twittering overhead, and, looking up, saw such a pretty sight that I shall never forget it.

"In this tree hung some thirty or forty of the elegantly-formed nests of woven grass of the Baya bird so well known to all. The heavy storms of May and June had torn away many and damaged others, so as to render them, as one would think, past repair; not so thought the birds, for a party of about sixty had come to set them all in order.

"The scene in the tree almost baffles description. Each bird and his mate thought only of their own nest. How they selected it I know not, and I should like much to have seen them arrive. I suppose the sharpest took the best nest, for they varied much in condition. Of some of the nests two thirds remained, whilst others were very nearly all blown away. Some of the birds attempted to steal grass from other nests, but generally got pecked away.

"As the wind was blowing freshly the nests swung about a good deal, and it was pretty to see a little bird fly up in a great hurry with a long bit of grass in his beak. He would sit outside the nest, holding on by his claws with the grass under him. He would then put the right end into the nest with his beak, and the female inside would pull it through and put it out for him again; and thus the plaiting of the nest went on. All this was done amidst tremendous chattering, and the birds seemed to think it great fun. When a piece was used up one would give the other a peck, and he or she would fly off for more material, the other sitting quietly till the worker returned. Nests in every stage of building afforded every position for the bird, who seemed at home in all of them.

"July 11th, 1865.—To-day I noticed that nearly all the nests had been repaired, and the birds were more scattered, either helping themselves to my jowar (*Sorghum vulgare*) in the field or collecting insects.

"July 20th.—I observed some eight or ten newly-built nests on the ground under the tree, which I believe to have been deliberately cut off from their supports by the thievish Striped Squirrels (*Sciurus palmarum*) for use by them in their nests. Some of these had unbroken eggs in them.

"August 18th.—Noticed to-day how the birds obtain their grass. The little bird alights at the edge of the high strong sarpat grass (*Andropogon euripeta*?) with its head down, and bites through the edge to the exact thickness which it requires. It then goes higher up to the same blade of grass, and having considered the length needed bites through it again. It then seizes it firmly at the lowest notch and flies away. Of course the strip of grass tears off and stops at the notch. It then flies along with the grass streaming behind it. As the edge of the grass is much serrated, the bird has to consider and pass it through the work the right way. This serration renders it so difficult to pull a nest to pieces, and makes the same nest last for years.

"In some instances the male continues to build for amusement after the nest is finished, not only elongating the tubular entrance, but also making a kind of false nest.

"Before the colony ceased building there were more than seventy nests in the tree."

A good deal has been written about the nidification of the Baya, which is more curious than true.

One gentleman, for instance, says :—"One bird I observed commencing its nest from the bottom, resting it on a twig having plenty of leaves!!"

The notes of admiration are mine, and it is not too much, I think, to say that this gentleman ought to have used spectacles. Numbers of notes on the nidification of the Baya have been kindly sent me, some very good and full ones, but I think Dr. Jerdon's and Mr. Horne's, which I have quoted, contain nearly all that need be said on the subject.

I add the following notes, however, as they throw light on some disputed points.

Colonel Butler writes :—"The Common Weaver-bird breeds abundantly in the neighbourhood of Deesa during the rains, commencing to build its elaborate nest, which takes about a month to complete, about the middle of July. There are two nests as a rule for each pair, one with a long tubular entrance for the hen, in which the eggs are laid, the other without this tubular passage and open at the bottom, with a perch of woven grass across the lower edge for the cock bird to sit in. I have constantly found only two or three, often four or five, and once as many as nine, but I am inclined to think that when more than three or four are laid in one nest, more than one hen bird assists in laying. I once found a nest containing *eleven* fresh eggs. I can offer no solution as to the mud question; to all appearances it looks most useless and unmeaning."

Mr. Benjamin Aitken remarks :—"The first nest I ever took of the Common Weaver-bird contained four young ones. This was at Satara, in the Deccan. Two, of course, is the almost invariable number of eggs laid."

The eggs of this species, like those of all the others of this group with which I am acquainted, are of a pure, dead, glossless white. They vary a good deal in size and shape, but are typically rather long ovals, a good deal pointed towards the small end. Long ovals pointed at both ends and blunt pyriform varieties are common.

The eggs vary in length from 0·72 to 0·9, and from 0·52 to 0·62 in breadth; but the average of forty eggs is 0·82 by 0·59.

721. *Ploceus megarhynchus*, Hume. *The Eastern Baya*.

Ploceus baya, Bl., *Hume*, *Cat.* no. 604 bis. •

Ploceus megarhynchus, *Hume*, *t. c.* no. 604 ter.

The Eastern Baya breeds from Sikhim down to Tonasserim from April to September.

Mr. Oates makes the following general remarks on the nidification of this Baya in Pegu :—"The breeding-season commences in April, and from ten to fifty pairs of birds nest in company. They either select the eaves of a thatched building, frequently nesting inside the verandah itself, or the pendent branches of a thorny tree. In this latter case they seem to prefer a tree the branches of which grow over the water. The eggs are two or three in number and pure white."

Mr. J. R. Cripps, writing from Eastern Bengal, says :—"Excessively common, and a permanent resident, very destructive to the paddy-crops when in the ear. In the cold weather the males drop the yellow crown. Builds in all kinds of trees and at various heights from the ground. It breeds from May to August. I have on several occasions found a second nest commenced from the

bottom of the tube of an old one, the upper nest being useless as the passage is closed up. They lay from two to five eggs, and very often only a single young one is found."

The eggs of this species, as might be expected, do not differ in colour and shape from those of *P. baya*. A large number of eggs from the Sikhim Terai measure from 0.75 to 0.92 in length, and 0.57 to 0.63 in breadth.

722. *Ploceus bengalensis* (Linn.). *The Black-throated Weaver-bird.*

Ploceus bengalensis (Linn.), *Jerd. B. Ind.* ii, p. 349; *Hume, Rough Draft N. & E.* no. 696.

I have never found the nest of the Black-throated Weaver-bird. I have shot the bird in the same localities (*e. g.* Sindh) as the last, but cannot tell whether it breeds in all of these.

Dr. Jerdon says:—"I found it abundant near Purneah, also in Dacca, building in low bushes, in a grassy *chur* overflowed during the rains. The nest was non-pensile, and had either no tubular entrance, or a very short one made of grass and more slightly interwoven than either of the others. Though a good many pairs were breeding in the neighbourhood, the nests were in no instance close to each other, rarely indeed two in the same bush."

Mr. J. R. Cripps, writing from Eastern Bengal, says:—

"18th June, 1878.—Shot the pair and took the nest with one fresh egg, all of which I sent to the Editor (Str. F.) for identification. From the oviduct of the female another fully formed, but soft, egg was taken. In front of my house was a small river, which, at this time of the year, had several deep pools at intervals along the bed. The public road ran parallel with the river, the bank of which in one place was about 15 feet high and overlooking one of these pools of water. This sloping bank was covered with brushwood-jungle about 4 feet high, and in one of the bushes this nest was placed. Several twigs had been bent down and incorporated with the roof of the nest, which had no lining. It was about 3 feet off the ground. The female flew off the nest and was shot, and the male on coming back from feeding was also shot while sitting on the nest. I failed to find any more of their nests; the one found was the only nest in that clump."

Mr. Henry Wenden has sent me the following note:—"On 28th August I found some eight or ten nests of this bird at Bhandoop, sixteen miles from Bombay, in a space of marshy land (water 6 to 18 inches deep) surrounded by rice-fields. They were built on that kind of grass which looks so like young sugar-cane, the blades of which were bent down and woven into the nest. In one case a nest was supported by only four blades, in another by ten or twelve. The tops of the nest were as globular as the entrance of the several blades of grass would permit of their being. None had pensile supports, and I noticed no entrance-tube of more than

2½ inches in length. Two nests each contained three eggs, one clutch being fresh and the other well incubated ; another nest had one egg.

"As regards material and the way it is woven, the nests are similar to those of *P. baya*, nor can I perceive any difference in size, colour, or shape of the eggs unless it is that those of *P. bengalensis* are slightly more pointed at the smaller end."

The eggs are similar to those of the other allied Weaver-birds, and measure from 0·79 to 0·85 in length by 0·35 to 0·6 in breadth.

723. *Ploceus manyar* (Horsf.). *The Striated Weaver-bird.*

Ploceus manyar (Horsf.), *Jerd. B. Ind.* ii, p. 348 ; *Hume, Rough Draft N. & E.* no. 695.

The Striated Weaver-bird, which Dr. Jerdon says does not occur in the North-West Provinces, is pretty common in suitable localities throughout the Indian Empire, except perhaps in the southern portion of the Indian Peninsula. It is, however, only where large pieces of water, or rivers whose banks are fringed with reed and rush, occur that it breeds. There are places in the Etawah and Mynpoore Districts, and again in Sindh, arid as these localities as a whole are, where nevertheless, finding suitable rushy, reedy cover, it breeds in great numbers. In one dhand in Upper Sindh I found nearly one hundred old nests in a small bulrush island not 20 yards in diameter.

They lay throughout Upper India in August and September. The nests much resemble those of *P. baya*.

They are formed of the same materials and woven in the same manner, but the upper or body portions are more massive and clumsier, and the tubes are shorter. The points of some forty or fifty narrow bulrush-leaves are commonly gathered together and incorporated into the upper portion of the nest to form a point of suspension. The true nest, exclusive of the tubular or entrance-passage, averages about 7½ inches in length externally, with a diameter of 5 inches one way by 4 inches the other. The tube is from 2 to 4 inches in length and about 2½ inches external diameter. The upper portion of the nest may be about 1½ inch thick, but the sides average about half an inch, and the entrance-passage is scarcely one fourth of an inch thick. What gives the nest a clumsy appearance is that the upper end of the nest terminates squarely instead of tapering more or less to a point, as is almost always the case in those of *P. baya* ; but then the nests of these latter are hung from one point of support, and not, as in this species, from a whole clump or cluster of supports. In outline, seen from one point of view, these nests are like a very short-handled meat-chopper, the tubular entrance standing for the handle.

They lay usually two or three eggs, quite as often three as two ; but I myself have never taken more.

From Etawah Mr. Brooks writes:—"On the 28th August, 1869,

I found a nest belonging to a pair of these birds. It was built among some high reeds or bulrushes which fringed one of the tanks at the side of the railway at Jheenjuck Jheel. The nest was fixed to two or three of the reeds near their summits, and was shaped like that of *P. baya*, but not so long, and as yet there was no lower tubular entrance. A former nest had been built and abandoned, as a colony of black ants had taken possession of it. When I found the second nest the birds were busy building it, and it was nearly finished. As yet no eggs had been laid."

Again, "On the 4th September, 1869, I found many nests in different reed-beds of Jheenjuck Jheel. Several pairs had young, but out of one nest I obtained three tolerably fresh eggs, which precisely resemble those of *P. baya* both in size, shape, and colour. Many of the nests found to-day had very long tubular entrances, longer even than the longest I have seen of *P. baya*. The body of the nest appears, however, to be generally smaller. Several of the reeds are drawn together, and from this junction the nest hangs."

Colonel G. F. L. Marshall says that this species "breeds commonly in the grass along the banks of the Ganges Canal in the Aligurh, Mynpooree, and Cawnpoor Districts. It is a gregarious breeder, and the nests are found in numbers together, though somewhat local. The eggs are pure white; the nest is square-topped, woven into the reeds or grass."

Dr. Jerdon states that this species "invariably breeds among high reeds, and usually in places liable to be inundated; and as the breeding-season is during the rains, the nest is thus unassailable except from the water. The nest is fixed to two or three reeds not far from their summit, and the upper leaves are occasionally turned down and used in the construction of the nest, which is, in all cases that I have seen, made of grass only. The nest is non-pensile, that is to say it is fixed directly to the reeds without the upper pensile support that the nest of the last species has; and in some cases the eggs are laid before any tubular entrance is made, a hole at the side near the top forming the entrance. This, however, is often, but not always, completed during the incubation of the female; and in other cases a short tubular entrance is made at first—in a very few prolonged to a foot or more. I have found the eggs in this case, as in the last, to be generally two in number, three in a few, and in one nest I found five."

Major C. T. Bingham remarks:—"Breeds in numbers at Delhi in the long grass on the banks of the Jumna from July to September. In one patch of grass occupying about one hundred square yards I found on the 5th September thirty-one nests of this bird; some with full-fledged young, some with fresh eggs, and others in course of construction only. Four was the greatest number of young or eggs I found in any one nest, but the majority contained three eggs or young ones. Although there was a tree in the centre of the grass, none of the nests were attached to it, all depending from the tops of the surpat clumps.

"One nest I cut down and carefully measured was constructed

of fine strips of the grass woven into a hollow egg, the long diameter of which measured 8 inches and the short 5 inches. From the centre of the hollow was the passage, measuring 18 inches in length by 2 inches in diameter, and hanging downwards; where this opened into the inside of the nest there was built a little wall of the same material, extending inside from side to side, so as to effectually guard the eggs from being thrown out even in a high wind."

Colonel Butler has furnished me with the following note:—"I found any number of nests of the Striated Weaver-bird at Milana, eighteen miles east of Deesa, in August and September, 1876. As a rule, they are fastened to reeds or bushes growing in the water, by the sides of tanks, open wells, or marshy ground, but at the same time it is not unusual to find them in high surpat grass out in the open country at some distance (a half mile or more) from water. They also often build in long grass overhanging ditches or small streams, and I have occasionally found a colony building in low thorny bushes and trees (*mimosa*, &c.) overhanging the water. The nests were almost exactly similar to those of *P. baya*, except that they are slightly smaller, and in some instances the tubular entrance is of immense length. There is one thing very remarkable about this species, and that is a peculiar habit they have of cementing yellow flowers (generally *mimosa*) to the nest with cowdung. The lower edge of the cock bird's nest is almost invariably thus decorated. The eggs are, of course, pure white and almost exactly like the eggs of *P. baya*, but perhaps slightly smaller. The cock bird is wonderfully attentive to the repairs of the nest, and may be seen, even when the young are hatched, flying backwards and forwards constantly with long strips of grass in his beak to execute repairs. I have not mentioned dates, as the nests were so numerous, but I may add that they commence to lay about the first or second week in August and continue laying all through September. They generally breed in small colonies, but single nests are not uncommon."

And again he wrote to me from Sindh:—"The Striated Weaver-bird breeds in Sindh in June, July, August, and probably in September also; and I have occasionally seen nests of *P. baya*, *P. bengalensis*, and *P. manyar* in the same tree; however, as a rule, I believe they breed separately. When I visited the E. Narra, Sindh, at the end of July 1878, I had an excellent opportunity of studying their breeding-habits, and I noticed that, although the nests were extremely plentiful all along the banks of the canals, there were seldom more than half a dozen in one group, and, although we travelled over many miles of country and occasionally saw the other two species (*P. baya* and *P. bengalensis*), still we never observed them in that district breeding in company with *P. manyar*, although very likely they do. The nests, which are usually built in tussocks of grass, by the side, or growing out of, the water, or in low trees or bushes standing in or growing by the side of the water, are of the usual Weaver-bird type, excepting perhaps

that the tubular entrances are shorter than in some of the other species (none of those I saw exceeded about $\frac{3}{4}$ or 1 foot).

"The normal number of eggs, I believe, is two, although we often found more in a nest. I observed nests occasionally in standing crops, attached to the tops of the jowaree stalks."

Captain Horace Terry observes:—"Between the fourteenth and fifteenth milestone from Bangalore, on the Madras road, there is a sort of jheel on one side of the road, which serves as a bund to the Oscottah-tank on the other side. Here in the end of August 1882 I found *P. manyar* breeding in large numbers. The nests are attached to reeds and bulrushes growing invariably where the water was 4 or 5 feet deep. I inspected all the nests I could, but could find no eggs. They were all either new nests or contained young birds. Several *P. baya* were breeding close by, their nests being attached mostly to babul or cocoanut trees.

"I visited the same place in July 1883, and obtained several eggs."

Mr. J. R. Cripps tells us that at Furreedpore, in Eastern Bengal, the Striated Weaver-bird is "very common. I cannot say whether this species is a permanent resident or not. At the commencement of May I have first noticed the Black-breasted Weaver-bird and this species, frequenting the grassy churs of the district. At the beginning of July the birds of this species commence to build their nests in small colonies, on the long grass clumps and bushes, wherever these latter are standing in water. The nest is quite distinct from that of *P. baya*, for which it can never be mistaken. It is a shorter and thicker nest than that of *P. baya*, built of the same materials, and generally with only an apology of a tube. The eggs are laid in July and August, and are from two to five in each nest.

Lastly, Mr. Oates remarks of Pegu in general:—"Commences to breed rather later than *P. megarhynchus*; in fact it waits till the elephant-grass, to which its nest is invariably attached, is high and green, which does not take place till the rains are well in."

The eggs of this species seem to average slightly smaller than those of *P. baya*, but in every other respect they are precisely similar—moderately broad ovals, a good deal pointed at one end, and of a perfectly pure, almost entirely glossless, white. The texture is very fine and compact, and the shells, though thin, are firm and strong.

In length the eggs vary from 0.71 to 0.88, and in breadth from 0.5 to 0.6; but the average is about 0.8 by 0.58.

724. *Floceëlla javanensis* (Less.). *The Golden Weaver-bird.*

Ploceus hypoxanthus (Daud.), *Hume, Rough Draft N. & E. no. 696 ter.*

The Golden Weaver-bird breeds abundantly throughout Lower Pegu.

Dr. Jerdon only tells us that it is "frequent in swampy ground near the mouth of the Rangoon River, where I also found its nest, solitary, in a thick thorny bush very similar to that of *P. bengalensis*."

Writing from the Pegu Plains in the neighbourhood of Wau, Mr. Oates remarks :—"This species breeds very abundantly in this neighbourhood; on the 25th of July I took a great number of the nests and found that most of them contained two eggs, but some few of them only one. The greater number of the eggs were much incubated.

"The nest is placed about 5 feet from the ground, invariably supported from below, and not hanging as is the case with the nests of other Weaver-birds. It is securely fastened to several stems and leaves of a large species of grass, or to the branches of some strong weed. In the compound of the bungalow at Kyeik-padien I found no fewer than four nests in a patch of weeds near the entrance.

"The nest is cylindrical, about 6 inches high and 4 inches in diameter externally, composed entirely of grasses, woven on the outside in a very clumsy manner, the whole exterior presenting a series of loops and sharp angles. The interior is formed of fine grass, nicely curved to the shape of the nest and perfectly smooth. The flowering ends of these fine grasses are in some nests brought forward so as to form a ring, through which the bird enters the nest. The entrance is at various heights, sometimes in the middle and sometimes quite at the top of the nest. It is about an inch in diameter.

"The colour of the eggs is very variable. The ground of some is white, the whole egg sprinkled with minute dots of pale brown. Of some the ground-colour is greenish white, profusely speckled with greenish brown, the specks having a tendency to form a ring round the larger end. Others are pale purplish grey, covered with a profusion of darker specks and spots of the same colour spread evenly over the egg and coalescing in places. Others are of a somewhat olivaceous tint, some without a single mark, while others have a few very indistinct lines and clouded spots at the thick end. In fact, from the examination of a large series, it appears that hardly any two eggs are alike. In one nest the two eggs were as different from each other as two eggs could well be; but as a rule the eggs out of the same nest bear a close resemblance to each other."

The nests and eggs, of which Mr. Oates has sent me a large series, are very correctly described by him; certainly the eggs are utterly unlike those of any of our other Indian Weaver-birds or Munias, and approximate to those of the House-Sparrow. Not only are they not pure plain dead white, but the shells are very smooth and fine and have a decided though not brilliant gloss. The ground-colour is white, greenish or greyish white, a delicate dove-grey, or pale purplish stone-colour; and while one or two of the latter colour are quite free from markings, the great majority

are some thinly, some thickly, speckled and finely freckled with pale greyish, greenish, or purplish neutral tint.

The markings, except an occasional black hair-line, are, in at least two thirds of the eggs, so minute that, looked at from a distance of a couple of feet, the eggs appear to be of one uniform grey, some darker, some lighter, some with a sepia tinge, some with a slight brown tinge, some with the faintest possible purple shade, some greenish; but a grey stone-colour is the prevailing tint of a large body of eggs, amongst which perhaps one in twenty or thirty is pure white with only a few brown specks scattered here and there, and a good many, perhaps one in ten, are a very pale grey, which look white amongst the darker varieties, though when placed beside a white egg they are distinctly grey.

A certain number of the eggs are distinctly freckled and mottled and spotted when looked into, but these mottlings are very inconspicuous as a rule. Only on about one egg in six or seven, one or at most two black hair-lines of the Bunting type may be traced.

In shape the eggs appear to be normally somewhat elongated though very regular ovals, but somewhat broader varieties, slightly pointed or compressed towards one end, occur.

In length the eggs vary from 0.68 to 0.78, and in breadth from 0.52 to 0.58; but the average is about 0.73 nearly by 0.54.

Subfamily VIDUINÆ.

725. *Munia malacca* (Linn.). *The Black-headed Munia.*

Munia malacca (Linn.), *Jerd. B. Ind.* ii, p. 352; *Hume, Rough Draft N. & E.* no. 007.

The Black-headed Munia breeds throughout Central and Southern India and Ceylon.

Mr. A. G. R. Theobald writes:—"I found the nests near Pothanore, in the Coimbatore District, during the latter half of October. They were placed amongst reeds growing in a small pond; they were round, with a round hole in one side for an entrance, and were composed of dry reeds and leaves of some flag-leaved grass very like those of the cholam (*Sorghum vulgare*). The lining was composed of the hair-like filaments from the broom-grass of this country. Seven is, I think, the full complement of eggs; I never found more in any one nest."

Dr. Jerdon states that "the nest is usually placed among reeds in tanks or in the beds of rivers; occasionally in long grass in the bunds of paddy-fields. It is a rather large, nearly round or oval nest, neatly but loosely made of grass, with the hole at one side, this is general being very artfully concealed by the interlacing of the fibres of grass, so that I have been puzzled for a few moments

to discover the entrance, and the eggs, four to six in number, are pure white."

Mr. F. R. Blewitt says:—"On the 19th July we were encamped in the open forest country in the immediate neighbourhood of the western side of the hill-ranges (branches of the great Vindhyan group) lying in the extreme eastern section of the Bhundara District.

"In a sugar-cane field not far distant from our camp we found five unfinished, and one all but complete, nest, containing a single egg, of the Black-headed Munia. The parent birds were shot while busily engaged in finishing off the entrance of the nest.

"This latter was nearly globular, a mass of coarse grass lined with somewhat finer grass, between 6 and 7 inches in diameter. It was more loosely constructed than those of *Estrella formosa*, several of which we had found in a similar locality, about a mile distant, two days previously. Both this nest and the other unfinished ones were placed amongst, and attached to the cane-leaves, precisely after the fashion of the Green Amadavat.

"I may note that again in another similar field, about half a mile distant, we found *Munia atricapilla* busy constructing its nest, two of which were finished, but none of them contained eggs."

Colonel Butler writes the following notes on the breeding of this bird near Belgaum:—

"Belgaum, 1st August, 1879.—A nest containing six pure white fresh eggs. It consisted of an immense ball of dry grass, coarse exteriorly, fine interiorly and round the entrance, which consisted of a small hole in the centre of the nest upon one side, the whole structure being about the size of a child's head, and was built in the centre of a sugar-cane field, suspended from the tops of the sugar-cane, and not supported from below as is usually the case with the nest of Munias. The sugar-cane was very tall and dense, and the nest, although a large one, well concealed, and probably it would have escaped notice altogether had I not observed the old birds passing backwards and forwards with grass in their mouths in the act of building.

"21st August, 1879.—Later on in August I found several half-finished nests in sugar-cane, the thickest part of the crop being usually selected, all of which were supported by and fixed in the upper blades of the plant, so that I am inclined to think that the nest found on the 1st August had been blown on one side by the wind, which would account for its being found suspended.

"On the 12th September, 1879, I found four or five more nests in the same neighbourhood in a sugar-cane field, within a few yards of each other, containing from five to six eggs each, more or less incubated, with the exception of one which contained a single fresh egg. One nest had been blown down by the wind and was hanging upside down about a foot below where it was originally built, but the old bird had not forsaken it and was sitting upon five eggs about to hatch. The nests were all precisely similar,

differing only from the one already described in being densely lined with a species of fine green flowering grass, many of the flowering stalks of which protruded round the entrance, the exterior being composed of coarse broadish blades of dry reeds. They were all built about the same height, near the top of the sugar-cane about 7 feet from the ground, and, as a rule, where the sugar-cane was highest and most dense.

"On the 14th September, 1879, I explored fresh sugar-cane fields and found several more nests, some building, some with fresh eggs, and one with two young ones and three eggs about to hatch. Some of them were quite low down, not more than 2 feet from the ground, and in a few instances built in open situations where the sugar-cane was short and thin.

"On the 17th of the same month, I spent another morning in sugar-cane fields, finding several more nests, some building, others containing either fresh hard-set eggs or young ones. No nests contained more than six eggs, and many only five, and as a rule the nests were solitary.

"12th September, 1880.—Numerous nests again this year in every sugar-cane field about Bolgaum, between the middle of August and middle of September. Eggs six to seven in number.

"17th September, 1880.—Many more nests, containing some fresh, some hard-set eggs, and some young ones. No nests contained more than six eggs, and many only five."

Captain Horace Terry tells us that on the Pulney hills this species is fairly common. "I found a new nest at Pittur in April, but got no eggs."

Colonel Legge writes that this species breeds in Ceylon from May to August.

The eggs of this species, which I owe to Messrs. Carter, Theobald, Butler, and others, are of the usual *Munia* type—dull, pure white, somewhat elongated oval eggs; there is nothing that I can see to distinguish them from those of *M. punctulata* and *M. malabarica*, except perhaps that elongated varieties are more common amongst them.

In length the eggs vary from 0·6 to 0·72 inch, and in breadth from 0·44 to 0·5; but the average is 0·64 by 0·47*.

* *MUNIA ORYZIVORA* (Linn.). *The Java Sparrow*.

Padda oryzivora (Linn.), *Hume, Rough Draft N. & E.* no. 708 bis.

This species, the well-known Java Sparrow, a native of that island, but now naturalized in Mauritius, Ceylon, and other places, has naturalized itself also in the neighbourhood of Madras, whence I have had many specimens, killed wild, as well as the eggs sent me by my friend the late Captain Mitchell. He "found a nest near Madras in August, containing five eggs. It was placed like a *Munia*'s, in a thorny bush, 7 or 8 feet from the ground. The nest was globular and very large, chiefly composed of fine grass, but with a few broad-bladed leaves of millet intertwined. The entrance small, circular, and lateral."

The eggs were very regular ovals, pure, glossless white, and varied from 0·7 to 0·75 inch in length, and were (all the three he sent me) 0·55 in breadth. *

726. *Munia atricapilla* (Vieill.). *The Chestnut-bellied Munia.*

Munia rubronigra, *Hodgs., Jerd. B. Ind. ii, p. 353.*

Munia atricapilla (Vieill.), *Hume, Rough Draft N. & E. no. 008.*

According to Mr. Hodgson, the Chestnut-bellied *Munia* breeds in the lower valleys and cultivated plains of Nepal in open jungle or brushwood, forming a large globular nest in the midst of bamboos, thick bushes or grass, on or close to the ground, composed of dry grass or straw loosely twisted together, and lined with finer rice-straw. It lays from June to August four to six small, oval, pure white eggs.

Dr. Jerdon says:—"According to Mr. Frith the nest is ordinarily placed in a babool tree in Lower Bengal, solitarily, and is composed of a large ball of the tufts of *Saccharum spontaneum*. I have always found its nest fixed to reeds or long grass, and suspect that Mr. Frith must have been mistaken in the identity of the owner of the nest above noticed, the more so because that is exactly the character, both as to materials and site, of the nest of the next species (*punctulata*) noticed."

Since the *Rough Draft* of this work was published, I have myself taken several nests in the Calcutta Botanical Gardens; and Mr. J. C. Parker has taken many more in the same place and has furnished me with numerous notes on the nidification of this species.

He says:—"I found a nest of the Chestnut-bellied *Munia* in the Calcutta Botanical Gardens on the 27th of July, 1874. The nest was fixed as described by Dr. Jerdon, to the stems of long grass near the top, and was a very conspicuous object, easily to be seen a long way off. The bird was on the nest, but the eggs were quite fresh, and though there were only five it is quite possible that had I waited more would have been laid."

Again he writes:—"On the 13th July, 1875, I took a nest with six eggs, and on the 20th August another with five eggs, of *Munia atricapilla* in the Botanical Gardens, Calcutta. This year the birds could not breed in the long grass, owing to the fact of there being none to build in, a thorough reform in the garden arrangements having been carried out this year. The two nests were placed, one on a species of prickly date-palm, the other on another species of palm about six feet high, an *Oreodarn* I think.

"I could easily have procured the bird in the first nest (as she allowed me to approach within a few inches of the entrance), but I was prevented from doing so by the number and size of the terrible needle-like thorns that protected the nest on every side—a perfect forest of bayonets."

Lastly, he says:—"I went over on Monday, the 29th September, 1875, to the Gardens, and I was rewarded by another nest and three eggs of *Munia atricapilla*. The nest was in a young pine-tree, forming one of the same avenue (leading to the great Banian)

as that from which I took the last batch of five eggs. I would not have taken this nest had I known there were only three eggs, but as it was placed on the highest fork of the tree, a lad had to get up and bring it down, although the tree was only some 12 feet high."

Dr. Scully remarks :—"This *Munia* is common in the central part of the Nepal Valley from the end of May to October, frequenting rice-fields and gardens. A nest taken on the 13th July in the Residency grounds was placed in a thorny hedge; it was a large globular structure with a trumpet-shaped entrance at one side; it contained five white eggs, slightly set."

Mr. Davison, writing from Mergui on the 21st June, 1875, remarks :—"In a dense tangled mass of swamp-grass and screw-pine I found, on the 20th June, a nest of the Chestnut-bellied *Munia*. The nest was most ingeniously woven in with the surrounding grass-stems so as to be entirely concealed, and I should certainly not have found it had I not seen the birds (for there were two of them) fly out.

"The nest is a ball of coarse swamp-grass and rush, roughly and loosely woven, measuring about 7 inches in diameter. The entrance, which is at one side, measures 2·5 inches in diameter.

"Most of the material composing the outer portion of the nest is still green; the egg-cavity is lined with dry grass, which is finer than that on the outside of the nest.

"Comparing the nest with one of *U. acuticauda*, there are many differences to be noted. It is somewhat larger than that of Hodgson's *Munia*, more globular, composed both externally and internally of coarser material, and notably it wants the projecting neck of fine grass-stems which one almost invariably finds not only in the nest of *U. acuticauda* but also in that of other species of the genus.

"The nest contained two eggs, of course pure white, but more elongated and conspicuously larger than any of the eggs of *U. acuticauda* that I took the same day.

"This is evidently the second nest of the season, there being numbers of young about which evidently have not very long left the nest.

"The species appears to be only a seasonal visitant to Mergui, where it goes to breed. When I worked in Mergui and its vicinity in November, I met with none of this species, but in May, on my return from the southernmost portion of the Province, I found the bird not uncommon about the swamps and paddy-flats in small parties, usually consisting of a couple of adults and three or four young."

Finally, Mr. Oates says, writing from Pegu :—"The nests and eggs of this bird may be found at all times from the 15th June to the end of September. Six appears to be the maximum number of eggs laid.

"The nest is placed in dense elephant-grass, attached to two or three stems at a height of four or five feet from the ground. Pre-

ferentially they select very swampy land. The nest is a loose mass of grass, spherical, cylindrical, or heart-shaped. The inside is lined with finer grass, the following ends being brought forward to the entrance, which is small and difficult to find. The eggs are without gloss, pure white. They measure from 0.54 to 0.69 in length, and from 0.41 to 0.48 in breadth, the average of sixteen eggs being 0.61 by 0.45."

A nest which I took on the 15th August was a large globular structure, about 8 inches long, 6½ high, 5 broad, the lower surface flat or nearly so, the upper domed, and with a large oval aperture, some 2½ inches high and 1½ broad, at one end. The nest was composed entirely of grass, rather solidly put together, and had no lining. On the external surface some coarse blades and pieces of flower-stems, with the fluffy seeds attached, had been used, but the greater portion of the nest consisted entirely of moderately fine grass-stems. The chamber was about 5½ inches long, nearly 2½ inches wide throughout, and nearly 3½ high in its highest central portion.

The eggs are very regular elongated ovals, pure white and glossless, and only vary from 0.54 to 0.68 inch in length, and from 0.4 to 0.47 in breadth.

727. *Uroloncha acuticauda* (Hodgs.). *Hodgson's Munia*.

Munia acuticauda, *Hodgs., Jerd. B. Ind. ii*, p. 356; *Hume, Rough Draft N. & F.* no. 702.

This species, which we may term Hodgson's Munia, the trivial name applied to it by Dr. Jerdon—the Himalayan Munia—being singularly inappropriate, breeds within our limits throughout the Himalayas east of the Gauges, at all elevations up to 5000 feet, throughout Assam, Cachar, Tipperah, Eastern Burma, and Tenasserim, in all well-wooded, undulating, or hilly localities.

Speaking of this species, *M. atricapilla*, and *U. punctulata*, Mr. Hodgson remarks that "these species are solitary in regard to nidification, but after the breeding-season they are all gregarious in a greater or less degree. They are exclusively graminivorous, feeding on hard grass-seeds or ceralia, according as one or the other are procurable; and they fix their large globular nests either among the spiny leaves of the palm trees or the thick interlaced branches of the lesser bamboos, but there is no weaving or sewing employed in the structure of the nest: it is merely a large ball laid against or upon naturally-blended branches of stiff leaves, and having a small round entrance either on the side or at top. The eggs are many, and in *M. atricapilla* are of a bluish-white colour. These birds are easily tamed and caged, but they have no song.

"The whole species are migratory, appearing in June and departing in November. Many of them breed in my grounds, and are solitary so far as I have observed. The nest is composed of grass, fibres, or leaves of *Pinus longifolia*, and is usually constructed in the midst of clumps of small bamboo or of the dog-

rose. The male and female labour at the work with equal assiduity, and share equally the task of rearing the young."

Writing from Sikkim, Mr. Gammie says:—"A nest taken out of a small tree some ten feet from the ground in the valley of the Ryang, about 2500 feet above the level of the sea, on the 20th June, contained six hard-set eggs. For so diminutive a bird the nest is enormous; externally it is fully 5 inches in diameter and 7 inches in height, and even the egg-cavity was nearly 6 inches deep and more than 2 inches in diameter inside, but the actual entrance was of course much smaller. It is entirely composed of grass, the basal portion and the exterior at the back, where it was wedged against the stem of the tree, of very coarse and rough grass, much of it broad-bladed, the upper portion and the whole of the interior of very fine grass."

Later, he remarked:—"This *Munia* lays between the middle of June and the middle of August, at elevations of from 2000 to 4000 feet. It builds from 6 to 20 feet from the ground, in open country, in shrubs and small trees. The nest is globular, entirely made of the grass-panicles from which the seeds have dropped, intermixed with a few bamboo-leaves, and measures externally about 6 inches in height by the same in width, while the cavity is about 3 inches in diameter by the same in depth from lower edge of entrance. The entrance is in the side, close to the top, with a quantity of the grass of which the nest is made projecting over it. The eggs are white, and five or six in number.

"This bird is much disliked by the natives, on account of the large quantities of rice it consumes. I have seen a flock of twenty or thirty clinging to a single head of flowering grass, when they appear, from a little distance, more like a swarm of bees than a flock of birds.

"My bird-skinner came back from Chola, but with very little, and nothing of any consequence. About ten days ago (16th November) I saw the young of *U. acuticauda* only half-fledged. I asked myself how it is that the young of this bird is hatched so much later in the year than all the other birds about here; and it struck me that the parents had sense enough not to have their young hatched until the rice (on which they chiefly feed) was ripe, so that they could, with the minimum of trouble, feed their brood. In the same way the Hornbill places its nest near or in fruit-trees, and contrives to hatch its young when the fruit of those trees is ripe, with which the male can easily feed the female and young. The time of the most abundant supply of food appears to me to have more influence on the nesting-time than has the season of the year. The same principle, in a kind of way, partly applies to human beings: for instance, in Kent and Sussex, the 'hopping-time,' when there is most money about, decides the time for marrying of many of the working-people of those counties."

Dr. Jerdon says:—"Its nest is of the usual structure, large, and loosely made of fine grass, and there are generally five or six white eggs. I found it far from rare on the Khasia Hills."

Mr. Irwin, who took a nest of this species in the Tipperah Hills in June, described it as composed of fine grass-stems placed in a half-open hole in a low bank. It contained five eggs nearly hatched.

Mr. W. Davison, writing from Mergui, says:—

“This species is either a very irregular breeder or it has several broods during the year. In November it was not only breeding, but there were many fully-fledged young abroad, usually in small parties without any admixture of adults; and now, in June, there are still young to be found that have not long left the nest, and nests are to be found containing eggs, both fresh and hard-set, while other nests are in course of construction.

“The species is very plentiful and breeds freely, resorting to gardens or low secondary scrub for the purpose, and never, to my knowledge, to grass or rushes.

“Usually the nest is placed at a moderate elevation in some bush—a thorny one, by preference.

“On the 20th June I took a nest with five fresh eggs from a small citron-tree. It was rather compactly put together, composed on the outside of dead leaves and coarse grass, and thickly lined with fine flowering grass-stems, the ends of which projected beyond the entrance, forming a short neck.

“The nest measured about 9·5 inches along its major axis and about 5·5 along its minor axis.”

The eggs of this species are elongated ovals, pure white and glossless, undistinguishable from those of other nearly allied species. They vary in length from 0·54 to 0·68, and in breadth from 0·4 to 0·45; but the average of forty-three eggs is 0·61 by 0·42.

728. *Uroloncha striata* (Linn.). *The White-backed Munia*.

Munia striata (Linn.), *Jerd. B. Ind.* ii, p. 356; *Hume, Rough Draft N. & E.* no. 701.

The breeding-season of the White-backed Munia varies apparently very much according to locality. In the Nilghiris they appear to lay in July and August. From Yercand a nest was sent me, taken on the 28th September, containing six eggs. Near Raipoor nests were taken in January, and in Manbhoom in April.

I have never taken the nest myself, and, though several have been sent me, they are not structures that, as a rule, bear carriage well.

A nest secured by Mr. F. R. Blewitt in the neighbourhood of Raipoor on the 2nd January was a very large, loose, partially domed, oval-shaped structure, composed interiorly of very fine grass-stems, exteriorly of coarser grass largely intermingled with dry bamboo-leaves. Exteriorly the nest was about 8 inches in height and 5 inches in diameter. The cavity, the aperture of which was a little on one side and nearly at the top, was nearly 5 inches deep and about 3 inches in diameter. The nest was very

loosely and coarsely put together. It was placed on a branch of a karounda (*Cariassu carounila*) bush, about 5 feet high, growing on the bank of a nullah.

Mr. E. Aitken writes :—"I once found a nest of this Munia in Bombay, about 12 feet from the ground, I think, in a small tree. I took no note of it at the time, but I recollect that they had two young ones flying about with them soon after. Perhaps, however, some particulars of a pair that bred in a cage may be useful. The nest was a darkened compartment, which they filled with fine grass which I gave them. I could not watch their operations too closely, for fear of frightening them; but I took some notes. First, they laid an egg with a soft shell, and broke it; so I supplied them with chalk and old egg-shells, and they began again. This time I thought the female laid three eggs; but only two young were forthcoming, and if she had another egg they must have disposed of it themselves. I supplied them with bread and yolk of egg, with which the male assiduously fed the female all the time of incubation and for ten days after the young were hatched. During these ten days I only saw the female twice. After that they shared the duty of feeding their offspring between them. The eggs were undistinguishable from those of *M. malabarica*."

Miss M. B. Cockburn tells us that "the White-backed Munia is not a resident on the Nilghiris, but accompanies the Amaduvads and Spotted Munias in their migrations, and is generally met with in their company, except in the breeding-season, when they are seen alone and in pairs. They are not numerous and are very shy, never approaching any house. In this respect they are quite unlike the Spotted Munia, whose unceremoniousness endears him to us.

"The White-backed Munia's nest resembles that of the Spotted Munia, being a large accumulation of grass with a small opening at one side. Nothing warm is used as a lining. The nests are found in July, and contain six or eight pure white eggs."

The late Captain Bevan stated that at Manbhoom "a nest of this species (like that of *M. malacca*, and as described by Dr. Jerdon), containing only three eggs, was brought to me on the 3rd April."

Dr. Jerdon himself tells us :—"In Malabar it is a familiar bird, being constantly seen on the roadside, about houses, and in stable-yards, and it builds in gardens and orchards, solitarily, making a large loosely-constructed nest of grass, and laying four or five white eggs during the rains."

Mr. J. Darling, Jun., remarks :—"This bird breeds very commonly up in the Wynaad. Builds a nest of grass, put together in a ball-shape, with a hole in the side; it builds in all sorts of situations, but is especially fond of building in the parasitic plants on 'gooseberry-trees.' They lay from four to eight eggs. I have found nests from April to June, and also in November and December."

Mr. Vidal, writing of the S. Konkan, says :—" Common everywhere in gardens and jungles. I have found numbers of old nests used as roosting-places, but have never succeeded in getting any eggs."

In Ceylon, according to Colonel Legge, these Munias appear to be constantly nesting.

The eggs which I have from Yercand in Southern India, Raipoor, and other places are precisely similar in appearance to many eggs of *Uroloncha punctulata*, *U. malabarica*, &c. They are regular, somewhat elongated, little ovals, very pure white and perfectly devoid of gloss.

They vary in length from 0.55 to 0.65, and in breadth from 0.42 to 0.47; but the average of ten eggs is 0.61 by 0.44.

730. *Uroloncha fumigata* (Walden). *The Andaman White-busked Munia.*

Amadina fumigata, *Wald.*, *Hume*, *Cat.* no. 701 ter.

Of this Andaman race, Mr. Davison says :—" They must breed very early, or rather, perhaps I should say, late; for when I arrived at the Andamans in December the young had left the nests. Several old nests that I found were large globular structures made of grass, with the entrance placed at one side and drawn out into a short neck—in fact, very similar to those of *S. amandava*."

731. *Uroloncha leucogastra* (Bl.). *The White-bellied Munia.*

Amadina leucogastra (*Blyth*), *Hume*, *Cat.* no. 701 bis.

Mr. Davison writes from Tenasserim :—" On the 25th of April last I took a nest of this species in dense forest between Malawoon and Bankasoon, and about six miles from the nearest open ground.

"The nest was a globular structure about 7 inches long by about 6 wide at the broadest part, and was composed of dry grass and bamboo-leaves, and lined with finer grass-stems and a few fibres, and placed in the fork of a sapling about seven feet from the ground. It contained a single white egg, similar to that of *U. acuticauda*."

Some eggs subsequently obtained are somewhat elongated ovals, at times very markedly so. Generally they are rather regular ovals, but some of the broader types are slightly compressed towards the small end. The shell is very fine, and apparently fragile, but pretty strong all the same. It is entirely devoid of gloss; the colour is snow-white.

Five eggs measured from 0.6 to 0.69 in length, and from 0.42 to 0.46 in breadth.

732. *Uroloncha pectoralis* (Jerd.). *The Rufous-bellied Munia.*

Munia pectoralis (Jerd.), *Jerd. B. Ind.* ii, p. 355; *Hume, Rough Draft N. & E.* no. 700.

I know nothing of the nidification of this species, but Miss Cockburn says they are summer visitants to the slopes of the Nilghiris about Kotagerry. She adds:—"These little birds build in July, and, like all of this species, construct a large nest. Many of them build in the eaves of a coffee-storehouse, which was thatched, attaching their nests to the thatch so far in as almost to be hid. They lay six or eight pure white eggs."

She has sent me a specimen of the bird; so that it is certain that she has not wrongly identified the species.

Miss Cockburn afterwards kindly sent me the following additional note, with a nest:—

"The nest of this bird was found at a coffee estate, about 3000 feet of elevation.

"The situation chosen was a large tree in front of the coffee godown, on a hill-side. The nest was built on one of the large outer branches, slightly concealed among the leaves, at the height of about twenty feet. The shape was perfectly round, about 7 or 8 inches in diameter. It had been commenced with long dried roots, to which was added the long leaves of a reed which grows near water. These leaves are from 3 to 4 inches long and 1 inch broad. A large quantity of fine, soft, downy grass-seed ears were accumulated, forming a completely round nest, with a small hole at one side; no lining. The number of eggs, 8 or 10. Only one brood is reared here, during the two or three months these birds remain here."

Mr. F. W. Bourdillon writes of this bird in the Travancore Hills:—"Another common species, residing on the hills all the year round. It is gregarious in habit, and feeds on grass and other small seeds. The nest is a large loose construction of fine creeping-grass, with perhaps a few feathers interwoven, deposited in a hollow stump, and contains six to eight white eggs laid about June or July."

The eggs that Miss Cockburn has kindly sent (which are smaller than those of either of the other species) are regular, moderately broad ovals, entirely glossless and snow-white, and vary in length from 0·61 to 0·63, and in breadth from 0·42 to 0·46; but they average 0·62 by 0·44.

734. *Uroloncha malabarica* (Linn.). *The White-throated Munia.*

Munia malabarica (Linn.), *Jerd. B. Ind.* ii, p. 357; *Hume, Rough Draft N. & E.* no. 703.

The White-throated Munia, like the Spotted one, breeds pretty well all over India, but the present species affects the more arid

tracts, the latter the well-wooded and watered ones. I know of no month in which in one place or another its eggs may not be found. I have taken them myself in January, February, March, and April, and again in July, August, and September. Mr. Theobald obtained them also in May, October, and December; Mr. R. M. Adam in November. They have certainly two broods, probably more; the great majority of nests will everywhere, I think, be found from January to March and from July to September.

Normally, in fact nine times out of ten, they place their nests in low, thick, thorny bushes, at heights of from 1 foot to 5 feet from the ground; but I have found them in the most out-of-the-way situations—once in a hole in a wall, once in an old thatch, several times in a haycock in my own ground, and once in amongst some dry bushes stuck up as supports for, and almost covered with, sweet peas.

Typically the nest is large and globular, loosely put together of fine and coarse grass, the latter predominating on the outside, the former on the inside, and with more or less of fine vegetable down as a lining. But they are sometimes only partially covered over, sometimes quite open above, and all kinds of odds and ends are not unfrequently pressed into the service. I quote a few old notes of nests made on the spot at the time of finding them:—

“Took a nest near Etawah on the 22nd January, 1867. It was composed entirely of the flower-stems of the *chireyan-ki-chunne* (*Agrostis* sp.), mixed here and there with a few tiny pieces of cotton, a small flock or two of wool, one little piece of red cloth, and a few very small pieces of coarse cotton fabric. It was placed in a small bush of the jherberi (*Zizyphus nummularia*) about 6 inches from the ground. It was open, broadly saucer-like, some few of the elastic grass-stems of the sides overhanging the cavity of the nest. It contained four pure white eggs.”

“A nest containing eight eggs, taken on the 28th January, 1867, was a complete sphere of soft grass with only a hole in the side. It was pretty thickly lined with cotton wool, and contained one or two small coloured rags. It was in a heens bush (*Capparis aphylla*), with other nests, about 6 feet from the ground.”

“January 28th.—In a bér tree, about 10 feet from the ground, the nest loosely made of the flowering-stalks of delicate grasses, with a good deal of cotton and one greenish rag incorporated; only one egg.”

I have never taken more than eight eggs in any nest, and I have never myself had any reason to believe that more than one pair were concerned in the construction or equipment of any nest I ever met with; but it will be seen that two pairs do sometimes combine to build and fill a single nest.

Mr. W. Theobald makes the following note of this bird's breeding in the neighbourhood of Pind Dadan Khan and Katas in the Salt Range:—“Lay in the months of May, August, September, October, and December. Eggs twelve and thirteen (=twenty-five) in number, ovato-pyriform, measuring from 0.59 to 0.64 in

length and from 0.44 to 0.5 in breadth; colour pure white. Two pairs of birds frequently, if not usually, are employed in the construction of one nest, in which the two hens consecutively lay, so the same nest has sometimes twenty-five eggs in it in different stages of incubation. Nest often clumsy and hastily made, but usually a neat domed structure of fine grass with one opening; sometimes prolonged into a short deflected neck partially closed by the elasticity of the long spikes of grass forming it; sometimes the nest is a simple platform of grass, open at each end, but the grass-ends curved over to meet at the top; usually placed in thorny bushes, often very conspicuously and close to roads. It is much to be doubted if the eggs found occasionally in October and December are hatched."

Mr. Brooks tells me he has often taken eggs at Mirzapoor in December, and I have found young birds often in the commencement of January, so that I see no reason to doubt the hatching of the December eggs.

Sometimes they will even share a nest with another species. Colonel G. F. L. Marshall remarks of this *Munia*:—"I have taken eggs hard-set in the first week in February in the Allahabad District. I have found them breeding in the eaves of a verandah, the nest being formed of the usual materials—fine grass-stems in seed, but used only to line the hole in the roof. Out of one nest similarly situated, but made of grass and feathers mixed, I took seven eggs of this bird and four of *Passer indicus*. The nest in this case was probably built by the Sparrow."

Major C. T. Bingham remarks:—"Breeds both at Allahabad and at Delhi from February to September. Eggs white, from four to eight in number; nest of grass, sometimes domed, sometimes a mere pad."

Mr. R. M. Adam, under date November 15th, 1867, writes from Baraich:—"On the 25th October I found a half-built nest of *Munia malabarica*; two days after, on visiting it again, I found it finished. November 3rd, I found three eggs; on the 9th one bird was hatched and four eggs in the nest: one was hard-set which I left, the other three I took and cleaned, and found in them just the germs of life. On the 10th the egg I left was hatched. On the 12th I found the birds had deserted the nest. It was built in a saro-tree (*Cupressus sempervirens*) in the public gardens, about 5 feet from the ground, and was composed of several kinds of green and dry grasses, some of the heads of which were downy, and these with some soft feathers formed the lining of the nest. The grasses were matted without much skill into a shape like a Florence flask without neck, and supported by the branches and twigs of the tree. There was only one opening, which measured 2 inches in diameter. In length the nest measured 6 inches, in width $5\frac{1}{2}$ inches, and in circumference, round thickest portion, 14 inches."

As for the size of the nests, this varies very greatly. I have seen some fully 2 feet in circumference.

Colonel Sykes tells us that "these birds live in small families. I have frequently found them in possession of the deserted nests of the Common Weaver-bird; but their own nest is a hollow ball, made of a delicate *Agrostis*, with a lateral hole for the entrance of the birds. I took a nest in the fork of a branch of the *Mimosa arabica*; it contained ten oblong minute white eggs. The cry of the bird is 'cheet, cheet, cheet,' uttered simultaneously by flocks in flight."

Long ago, after a shooting excursion we had made together, Mr. F. R. Blewitt wrote me the following account of a nest of this species that he found in the Delhi District:—"You may remember, the first morning we went out together, just after you had shot the Buzzard, having a large nest on a reunj tree searched; it was then empty, but the other day, happening to pass that way, I found three eggs of the 'eternal' *Aquila fulvaceus* in it. As my man ascended the tree to fetch the eggs, I saw a pair of the small *Munia malabarica* hopping about from branch to branch, near to the nest, in great anxiety, chirping loudly all the while. Taking the binoculars to watch the birds and their, as it appeared to me, strange movements more closely, I saw one of them suddenly enter and disappear in a small hole in the under part of the large nest; the other immediately followed the first, then both came forth and commenced hovering about the man, who had by this time reached the nest. Not knowing what the hole could be there for, I directed the man to inspect it, when to my astonishment it turned out to be a nest in a nest. The Munias evidently had selected that of the Eagle to make their own in to secure warmth from their mighty companion. From the position of the under nest, the Munias at any time when in it could not have been more than 2 inches separated from the sitting Eagle."

Years later he favoured me with the following general account of the nidification of this species, founded on his experience in the Delhi, Jhansi, and Saugor Divisions:—"Breeds in August and September. The nest is a large loosely-constructed fabric of fine grass, at least on the outside. The lining is of soft flowering grass, and very neatly laid on in the interior of the nest. The nests are almost always found supported in the branches of low jungle bushes, sometimes about the middle of the bush, at others near the top. The nest is of various shapes, and its intended form appeared to me to be previously regulated according to situation. When it could be done with convenience as well as safety, the nest assumed an almost globular shape, with an entrance-hole at one side; at other times it was open at the top, with the sides, or rather the grass of the sides, curving over. Again, some of the nests were of the shape of a hemisphere, with a hollow for the eggs; but of whatever shape the material of each nest was precisely the same—fine grass outside, and the lining of the flowers of grass.

"It is very difficult to state the regular number of eggs of a pair. I have found as many as fifteen in one nest, and every one of

them quite fresh, at least on blowing them they appeared to be so. No doubt the eggs were of some two or three pairs. But I believe six is about the regular number of one pair. In the assistant's bungalow at Bubeena, a Weaver-bird's nest was hung up at one end of the verandah. Some short time after a pair of *Munias* took possession of it, and, though the people were constantly passing within a foot or two under it, the female laid six eggs. Unfortunately, one night the peon on watch with his *lathi* accidentally struck the nest and capsized it, eggs and all."

From Poona, Mr. E. Aitken writes:—"I have seen countless nests of this bird, but it is difficult to give any accurate account of its nidification, owing to the confused way in which it manages its domestic affairs. Sometimes two pairs seem to unite in partnership, or, again, solitary females will go on laying any number of barren eggs, as fast as the lizards can eat them up! So my information must be a little vague.

"In Poona they breed in the cold season; they commonly build all over the rocky plains, but many also in gardens in the cantonment. The nest is usually about 6 feet from the ground, and varies from a large hollow ball of fine grass, with a hole at one side, to a flat nest with some of the grass bent over in an arch. The material is almost always plain grass, and there is no lining. In one case, which I took to be a real *bonâ-fide* attempt to bring up a single family, I counted with my finger six eggs; but I cannot remember any other trustworthy case in which there were so many eggs belonging to one pair.

"I believe they frequently use their own and each other's old nests. Jerdon does not mention that they employ their old nests to sleep in. I have driven a whole flock out of one after dusk."

Colonel Butler makes the following remark:—"I have seen numerous instances in the neighbourhood of Belgaum of nests built in the stick nests of *Neophron ginginianus* and *Aquila vindhiana*, similar to the instance mentioned in the 'Rough Draft of Nests and Eggs,' p. 453. In fact this appears to be one of the favourite sites selected.

"This *Munia* breeds in the neighbourhood of Deesa most plentifully I fancy during the rains, but I have taken nests in almost every month in the year. I have seen as many as fifteen eggs in one nest, and numbers varying from nine to twelve are common. On the 28th September, 1876, I found a nest containing fourteen eggs, of which seven were much incubated, two slightly so, and five quite fresh. Only one pair of birds appeared to be in possession of the nest."

Mr. G. Vidal, writing of this *Munia* in the S. Konkan, says:—"Scarce. I found a nest on the 28th January, 1879, in hill-side jungle in a *hér* (*Zizyphus jujuba*) tree. The nest, a round globe, was made externally of very dirty coarse grass, with a very small opening at the top on one side. The nest inside was also shabby, but the lining was of finer grass, and for ornament there were a few Green Paroquet's feathers. Two old birds were sitting on

four eggs. I got one bird, and while I was waiting for the other to return, a lizard got into the nest, and within five minutes succeeded in destroying three of the eggs, breaking two and making away with a third."

In the Deccan, according to the testimony of Messrs. Davidson and Wenden, this species is "very common, and breeds at all seasons."

In Ceylon this species breeds from December to March.

The eggs are pure white, spotless, and devoid of gloss; typically rather broad and perfect ovals, not unfrequently more or less pointed towards the small end. Compared with those of *M. malacca*, *U. punctulata*, *U. pectoralis*, and *U. striata*, the eggs of the present species are slightly smaller and decidedly rounder.

In length they vary from 0.55 to 0.68, and in breadth from 0.45 to 0.5; but the average of fifty eggs is 0.6 by 0.47.

735. *Uroloncha punctulata* (Linn.). *The Spotted Munia*.

Munia undulata (Lath.), *Jerd. B. Ind.* ii, p. 354.

Munia punctulata (Linn.), *Hume, Rough Draft N. & E.* no. 000.

The Spotted Munia breeds throughout India and Burma, alike in the plains and in the hills, up to elevations of from 4000 to 5000 feet, but as a rule only in well-wooded and watered tracts. In the more arid portions of the North-Western Provinces, the Punjab, Rajpootana, and Sind, it is but rarely, and in many localities never, seen.

I have invariably found the nests in July and August, both in the plains and in the Himalayas, but in the Nilghiris the breeding-season seems to last in one part or other of these hills from February to September.

The nests are, as a rule, placed at heights of from 5 to 7 feet, and very rarely above 12 feet, from the ground, in thick thorny bushes or trees. In the plains the various species of acacias, in the hills the barberries, are much resorted to as nesting-sites. Occasionally the nest is placed in very unexpected situations in and about houses, as amongst the creepers trained against the verandah trellis, in a large straw scarecrow placed in a garden close to the house, in an old thatched roof, &c.

The nest is globular, very large indeed for the size of the bird, an oblate spheroid as a rule, from 8 to fully 10 inches in diameter, and 6 to 7 inches in height. The nest is usually wedged in between some convenient fork, and not uncommonly rests upon a sort of foundation of the same materials as those of which it is itself composed, viz., rather coarse, often broad-bladed grass, used green, rice and barley straw, leaves of bajera and jowar, and the like. The entrance is on one side, circular, about 2 inches in diameter, and neatly lined throughout, together with the whole interior of the cavity, which may average 5 inches in diameter, with fine grass-stems, the beards of wheat (our Indian bearded wheat), and barley, or rarely fine wire-like roots.

The number of the eggs laid varies much. Seven I consider to be the normal number, but I have found only four hard-set, and some of my correspondents have taken ten eggs in a single nest.

From Hoshungabad Mr. Nunn writes :—"Nest and seven eggs secured on 11th August; the former was made on the branches of a low thorn-bush, some 6 feet high, well sheltered by the leaves. This low thorn-bush was growing with others at the base of a rocky hill far from water.

"The nest was a large loose ball of grass as big as a man's head, with a circular lateral aperture about as big as his mouth. Eggs slightly set."

Mr. F. R. Blewitt thus graphically and accurately describes a very curious nest which he kindly sent me :—"A nest of this species, which I obtained in the neighbourhood of Raipoor, was remarkable as being more compact and massive than those of this species usually are. It was a very irregularly-shaped nest, something in outline like a gouty foot done up in bandages, the toe pointing downwards, and the aperture where the leg would join on; exteriorly it was composed of coarse broad-leaved grass; interiorly of fine grass and flowering grass-stems. The walls were fully an inch thick and very compact. The cavity, measured from the aperture to the bottom, was 6 inches deep, and something less than 3 inches in diameter; exteriorly the nest was some 9 inches measured from heel to toe, and 6 inches from the heel to the mouth of the aperture, and some 4.5 in breadth. The whole exterior portion was composed of green grass, but the fine lining was dry."

Mr. Wait, writing from Conoor, says :—"This little bird breeds with us any time between February and September, but the majority lay during April and May. They make a large, oval, globular nest, some 9 inches high and 7 or 8 inches in breadth; it is loosely constructed of dry grass, usually the finer sorts, and lined with the same. The entrance, which is on one side, is small. The nests are placed in low trees and shrubs, commonly in such as are well furnished with thorns. They lay from five to eight oval dead-white eggs."

To my friend Miss Margaret Cockburn I am indebted for the following charming account of the nidification of this species :—"The Spotted Munia is migratory with us, and only appears on the Nilghiris during June and the four following months.

"They return regularly to their old haunts, even to the same bushes in which they built the previous season.

"Several pairs of these birds build in the trellis around our windows, so near the ground that I have often put my finger into the nest and felt the eggs.

"I am perfectly sure that each pair takes possession of the same trellis in which it built in previous years, and that should the old nest remain where they left it they commence another alongside of it; should, however, the old abode be removed, they will build again in the exact site which it occupied.

"The great majority migrate, as already mentioned, to the low country during the cold season, and return when the small grains, millets, and the like (cultivated so abundantly by the hill-tribes), are just beginning to come into ear. I have, however, observed one or two of these birds among flocks of Amaduvats during the month of December.

"I have watched with great interest the punctual return year after year of these pretty, friendly little birds, and have very carefully noted their behaviour and habits. In selecting a place to build on they sit on a twig, and raising themselves as high as possible, flap their wings over their backs to ascertain that no small branches are likely to obstruct the progress of their building, thus appearing to be fully aware that their nest will occupy a good deal of space. When perfectly satisfied as to the convenience of the spot, the female remains there while the male flies to a short distance, alights on the ground, and breaking off a piece of fine long grass flies back with it to the female, and continues to bring her at least one piece every minute, while she carries on the building-process alone.

"They begin early and build for an hour or so, then leave it till evening and work late, keeping up an incessant cry of 'Kitty, Kitty, Kitty.'

"The nest is composed entirely of grass; the entrance is at one side, a small round hole, so small that two fingers can hardly be inserted. They build in July and August, and lay from six to ten white eggs, so beautifully translucent that the yolk is clearly seen through the shell. When the young are fully fledged they accompany their parents to the grain-fields, but continue to return to their nests every evening for a long time after they have left them entirely during the day.

"How they all manage to get in is wonderful; the nest appears perfectly full, and they seem to be restless and uncomfortable for some minutes after entering. In the morning they fly out one by one; those that go first wait for the others on some bush close by; when all are out away they fly in a flock, and are not visible near their nest during the rest of the day. At one time I counted no less than fourteen nests of these birds in the trellis of our verandah and windows; besides these there were others in the garden on orange-trees and scarlet geraniums, which latter here often grow to the height of 6 and 8 feet. Natives frequently go to the nests of these birds during the night, and suddenly shutting up the hole carry off the nest with all its contents, which sometimes amount to twelve birds, parents and young included.

"I have known instances of the House-Sparrow taking possession of the Spotted Munias' nests. They wait till the latter have finished building, and then (being much bolder birds) drive the poor Munias away, and, adding to the warmth of the nest by a number of feathers, appropriate it to their own use. On one occasion a pair of these Munias had taken a fancy to the trellis at my window. When their nest was completed, an imper-

tinent cock-Sparrow seemed determined to take possession of it; but I was equally determined he should *not*. After a good deal of trouble, the poor owners were again the proprietors of their lawful abode. They appeared to be quite aware that I was taking their part in the arbitration business, and would sit patiently on a fuchsia-bush close by till the case was decided. Sometimes one of their own species would approach their building, but at these times I considered them quite able to fight their own battles and merely looked on. They required no assistance; but would sit close to their nest, cracking their mandibles to show how decidedly displeased they were. This proceeding used often to have the effect of inducing their unwelcome visitor to take his departure; but if he did not think of going soon, they would fly at him and use their bills to such purpose as to make him glad to be off.

"Yet, notwithstanding that these little birds are so tenacious of their rights when invaded by one of their own species, they are easily intimidated by any strange and unexpected object. A few articles of furniture being placed under the trellis, which contained several of their nests, so completely frightened the parents away at one time that they left their helpless brood without food, and would not return even when the objects of offence were removed. Of course the young, receiving no nourishment all day, became fainter and fainter in their cries for food, and at last died."

Writing from Sooramungalum, in Salem, Mr. A. G. R. Theobald remarks:—"In this district the breeding-season is August. They construct a large round nest (some 25 inches in circumference, with a small circular hole on one side as an entrance) of the broad leaves of cholam (*H. sorghum*), rice- and barley-straw, and in some very thorny bush or tree, commonly selecting the valum (*Acacia*, sp.). The nest is lined with barley-beards. I have always found seven eggs; never more.

"The pair generally lay a thick foundation (as we may well call it) of cholam-leaves between the forks of a convenient branch, and then they commence building the proper nest, which is of an immense size compared to the bird, which is about $5\frac{1}{2}$ inches in length. It takes them some days before the nest is properly completed. The pair are always seen to fly out of the nest (during the time of incubation) when disturbed, but I cannot say for a certainty whether they *both* sit on the eggs or not; I think they do, as the number of the eggs is too great for a single bird to cover. I very seldom found a bad egg amongst the ones that contained young ones. I usually found only a single pair building on a tree, but occasionally several build in the same."

Dr. Jerdon remarks that "it builds in thorny bushes, chiefly about fields, and makes a large nest of very fine grass, or not unfrequently of the flowering-tufts of some *Saccharum*, which I have often seen it conveying to its nest; and I have always found the nest solitary, contrary to Mr. Layard's observations, who states that he has seen thirty or forty nests in one tree, and that in one instance he found one structure containing several nests. The

eggs, of course, are pure fleshy white, usually four to six in number. At Thayetmyo I found it building in a hole in the thatch of my bungalow."

Mr. Holdsworth tells us:—"I have seen many nests at Orissa and near Colombo, and have often watched the bird biting off the grass-stems and taking them to the nest, which has been generally a large structure, sometimes placed near the end of a branch, but more commonly in a thick bush."

Colonel E. A. Butler writes:—"I found the Spotted Munia breeding at Mount Aboo in September 1875.

"A pair were building at the top of a palm tree, about 30 or 40 feet from the ground, on the 23rd instant; and I found another nest on the 28th instant, the eggs of which had, however, unfortunately been destroyed (probably by rats, as portions of the shell remained at the bottom of the nest)."

Writing from the plains of Pegu, Mr. Eugene Oates says:—"This species builds generally in July and August, but a few nests are to be found throughout the year. It is common all along the Irrawaddy valley, and nests chiefly in thorny bushes, almost always within reach of the hand."

The eggs of this species, and I have a vast series from different parts of the country, are typically elongated ovals, more or less pointed towards the small end; and although single eggs might be picked out to correspond, when a large series of the eggs of this bird and *U. malabarica* are compared, the more elongated character of the former is very marked. They are, when fresh, before blowing, a delicate pinky white, the shells, as in the case of so many pure white eggs, being partially translucent; when emptied of their contents the shells are like little balls of snow, pure, dead, spotless and glossless white, occasionally, as is the case always with similar eggs, more or less discoloured if incubation has been at all prolonged.

They vary in length from 0.59 to 0.75, and in width from 0.44 to 0.52; but the average of fifty eggs is 0.65 nearly by 0.46.

737. *Stictospiza formosa* (Lath.). *The Green Munia.*

Estrela formosa (Lath.), *Jerd. B. Ind.* ii, p. 301; *Hume, Rough Draft N. & E.* no. 705.

The Green Munia is common enough in many parts of the Central Provinces, but I only know of its nesting in the wilder eastern districts of these.

In the Raipoor District it breeds, I believe, from October to the middle of January, and probably again in the early part of the rains in sugarcane-fields, or perhaps amongst the dense jungle-grass that fringes in most localities the banks of streams and rivers.

Mr. F. B. Blewitt writes:—"For years have I tried to secure the eggs of *S. formosa*, but without success. When at Saugor, in the month of May, in a sugarcane-field, a favourite resort of this

Waxbill, my men discovered two nests—one complete, and the other all but finished—built on, and firmly attached to, the stalk-ends of two or three of the upper leaves. They were somewhat oblong in shape, and very neatly and compactly made. The interior lining was of fine grass, the exterior of coarse grass and long strips of only sugarcane-leaves, well interwoven with the coarse grass. The men told me that the birds had deserted the nests; but, on inspection, I had reason to discredit their statement.

"Two years ago, in January, my men shot on the banks of a stream here, in high grass, a young bird that had but just left the nest. Every search was made all along the bank of the nuddee for nests, but unsuccessfully. It would thus appear that *S. formosa* breeds twice a year."

Later, however, Mr. Blewitt did succeed in getting the eggs. He says:—"On the 17th July we were encamped in the open forest country in the immediate vicinity of the western flanks of the hill-ranges of the extreme eastern section of the Bhundara District.

"In a sugarcane-field of about two acres in extent, on the bank of a broad hill-torrent, I found four unfinished and three complete nests, each containing five eggs, of *S. formosa*.

"The nests, one and all, were some five feet from the ground, in the upper portion of the sugarcane, the stalk forming a side-support opposite the entrance. The framework of the nest is first strongly and neatly secured by lacings of coarse grass between two of the cane-leaves, one above and the other below; but as the building proceeds, three if not four, additional leaves are caught on to the sides of the nest and firmly interlaced in the exterior material. The inner portion or lining is completed last. When finished, the nests are large globular structures, made exteriorly of coarse grass and strips of the cane-leaf itself, the inner cavity being thickly lined with very fine grass, all somewhat compactly put together.

"The entrance-hole, which is prolonged into a short neck, is invariably in the centre, opposite the sides supported by the cane-stalk, and is well-concealed by projecting grass-fibres.

"Five is apparently the normal number of the eggs, and both sexes are equally employed in building the nest and incubating the eggs. One male was shot busily at work at the short neck of the nest, the female the while sitting on the eggs. Evidently a new nest is prepared each successive season, and I think they always breed in society, several nests being found in close proximity."

The eggs, as might be expected, are snow-white and entirely devoid of gloss. In shape they are somewhat elongated ovals, some few of them slightly compressed towards one end.

In length they vary from 0.61 to 0.7, and in width from 0.45 to 0.48; but the average of fourteen is a little more than 0.66 by nearly 0.47.

738. *Sporoginthus amandava* (Linn.). *The Indian Red Munia.*

Estrelda amandava (Linn.), *Jerd. B. Ind.* ii, p. 350; *Hume, Rough Draft N. & E.* no. 704.

The Indian Red Munia breeds pretty well all over the Indian Empire (except in the Punjab), in suitable localities. In the bare portions of the North-West Provinces and Rajpootana I have never known it as more than a passing visitor; but wherever the country is well-watered, and either well-wooded or abounding in high grass—in Meerut and the districts of the Doab northwards, in many places in Oudh and Rohilkund, Saugor, Chanda, Raipoor in the Central Provinces, in the more fertile portion of Sindh, in all our Dhoons and Terai—I know of its nesting.

In all these localities it breeds, I believe, twice a year—once from November to February, and the second time from June to August; but in the Nilghiris, which it ascends to an elevation of 6000 feet, the breeding-season seems to last from May to December. In the Himalayas I have never heard of its breeding at elevations exceeding 2000 to 3000 feet.

All the nests that I have myself found were oblate spheroids, loosely but not untidily built with fine grass, and lined with fine seed-down, the entrance circular and at one side, perhaps $1\frac{1}{2}$ inch in diameter. Externally the nests vary in diameter from 5 to 7 inches, and in height from 4 to 7 inches.

One nest of this species sent me from the neighbourhood of Saugor was of a deep, clumsy purse-shape, almost egg-shaped; it had been laid in a fork of a bush sideways, the aperture being at one end; it was very loosely and raggedly put together with fine stems of grass, and thickly and warmly lined with grass-seed down. The cavity was about 4 inches deep and about 2 inches in diameter, and narrow at the mouth. Externally the nest was 5.5 and 4.75 inches in diameter and 6 in length.

I have invariably found the nest in thick dwarf bushes, very close to the ground, at most at a height of three feet.

Six is, I believe, the full complement of eggs; but seven and even eight may occasionally be found.

Mr. F. R. Blewitt says:—"The Indian Amadavat breeds freely in the Raipoor and Sumbulpoor Districts. The 8th December is the earliest, and the 25th February the latest, date on which we have there taken the eggs. Wild plum (*Z. nummularia*) bushes growing promiscuously in the grass-jungles near to, or on the borders of, the banks of the many large and small streams intersecting the open forest country are preferentially selected for nesting. Occasionally an old nest, well concealed in the interior of the bush, has been discovered on a plain distant from water.

"The nest, for better concealment and protection, is generally constructed about the centre of the bush, from a foot to three feet from the ground. Only on one occasion, when stalking Chestul on

the bank of a stream, did I find a nest, at the base of a small plum-bush, with the under portions resting on the ground. So well concealed was it that, but for the sudden flight of the female on my near approach, I should never have detected it. The nest contained six tiny creatures a day or two old.

"The nest, in dimensions and shape, much resembles that of *U. malabarica*, though more neatly and compactly made; the opening is invariably at the side. Coarse and fine grass constitute the material of the fabric. On some nests I have found spiders' web in places firmly attached to the exterior. And here I may note a curious fact. The male bird often persistently continues to bring and add materials to the nest during the process of incubation. The return of the bird with grass in his beak has many a time betrayed the situation of a nest, with the female and full complement of eggs more or less incubated, which, but for this singular habit, would never have been discovered. The largest number of eggs taken in one nest was eight; but six would appear to be the normal number. The Red Munia, according to my experience, breeds but once a year, building a fresh nest each time. The eggs are laid daily; but the full period of incubation I have not ascertained. Both parents share in the building of the nest, as well as in hatching and feeding of the young."

Colonel Butler writes:—"On the 27th September, 1880, I found a nest at Belgaum containing seven tiny, fresh, white eggs. It was placed in the centre of a low bush, in a nullah overgrown with long grass, and consisted of a good-sized ball of dry grass, coarse exteriorly, fine interiorly, lined with a few large white feathers; in fact, the cock bird brought one of these feathers to the nest just before I took it. A few heads of fine flowering grass protruded from the entrance, which was rather large for the size of the nest, and on one side. The cock and hen seemed to take it turn about to sit on the eggs, and were not at all shy, returning several times to the nest before I had walked ten yards from it. Eventually I snared them both at the nest, capturing the cock bird first and the hen a few minutes afterwards. Two more eggs were taken by one of my nest-seekers the same day, from another nest."

He adds:—"Mr. Davidson sent me three eggs taken at Dhulia, Khandesh, 10th October, 1880, and others at Pimpalnr, Khandesh, 21st January, 1881."

Writing from Kotagerry, Miss Cockburn says:—"These birds build *large* round nests, consisting entirely of fine long grass, and lined with a few feathers; the entrance is at one side. They appear fond of placing their nests at the roots of small bushes, and sometimes among the branches, but *very* low down. They lay six *very* small white eggs, which, without exception, are the most diminutive I have ever found in any bird's nest here. They build their nest in November and December."

I never happened to find feathers in any nest; and Mr.

Davison, too, says :—"The Amadavat breeds with us on the Nilghiris from August to November. The nest is a large globular structure of grass, with the entrance to one side and near the top. For the size of the bird this nest is exceedingly large, being quite as large as a man's head. It is composed of fine grass and of nothing else, never being lined with feathers, as that of *U. punctulata* very often is. The eggs, five in number, are pure white."

From Conoor, Mr. Wait remarks that "here they breed from May to September. The nest carefully domed, just like that of *U. punctulata*, but smaller. It is composed of fine grass, and lined with the same. The eggs usually about five in number."

Dr. Jerdon states that "the nest is large, made of grass, and placed in a thick bush, or occasionally in long grass or reeds, and the eggs, six to eight in number, are very small, round, and white."

Mr. Rhodes W. Morgan, writing from South India, says :—"It breeds on the Nilghiris in August and September, building a large domed nest of grass, with the entrance in the side. Several females seem to lay in the same nest; for I have found as many as fourteen eggs in a nest, and have seen five birds fly out."

The eggs of this species are, like those of the whole family, pure white and glossless when blown, more or less pinky white when first found, owing to the partial translucency of the shell. In shape they are oval, and though very broad often a good deal pointed towards one end, and sometimes towards both. In size they are considerably smaller than those of any of the *Munias* except *U. acuticauda*, and they are shorter than these even.

In length they vary from 0.52 to 0.62, and in breadth from 0.4 to 0.46; but the average of fifty-six eggs is 0.55 by 0.43.

739. *Sporæginthus flavidiventris* (Wall.). *The Burmese Red Munia.*

Estrela flavidiventris, Wall., *Hume, Cat.* no. 704 bis.

Mr. Oates, writing from Pegu, informs us that this species "commences to make its nest about 15th October. I have taken the eggs on the 2nd November, and subsequently in the same month. The nest is placed near the ground in soft luxuriant grass. It is a spherical mass of grass, about 6 inches outside diameter, with an opening at the side. The majority of the structures are lined with feathers, but a few nests are without them.

"Six is the maximum number of eggs; four only are frequently found. They are pure white, with little or no gloss. They measure from 0.53 to 0.59 in length, and from 0.42 to 0.46 in breadth; the average of ten eggs is 0.55 by 0.44."

The eggs are of the usual type, as a rule extremely regular, moderately broad ovals, with occasional abnormal shapes, pure white, and glossless.

Family FRINGILLIDÆ.

Subfamily COCCOTHAUSTINÆ.

741. *Pycnorhamphus icteroides* (Vigors). *The Black-and-Yellow Grosbeak*.

Hesperiphona icterioides (Fig.), *Jerd. B. Ind.* ii, p. 384.

Pycnorhamphus icterioides (Fig.), *Hume, Rough Draft N. & E.* no. 725.

Common as is the Black-and-Yellow Grosbeak in the pine woods a few miles north of Simla, I have never succeeded in obtaining an egg there, though I have had barely fledged birds repeatedly brought me. They breed in all the pine forests of the Himalayas south of the first snowy ranges and west of the Ganges, at elevations of from 6500 to 9000 feet. Many people have found their nests with young, but, so far as I know, Captain Cock is the only person who has taken their eggs.

This gentleman told me that he "found this bird breeding in the station of Murree and also in Cashmere. May and June is the usual time. My first nest, containing three eggs, was taken on the 28th May, at 8000 feet elevation, upon a sapling lime. I climbed up and found three eggs in the nest, which was constructed of a few twigs and grass, and lined with stalks of maiden-hair fern and fine roots. I shot the female as she left her nest.

"Nests subsequently found seemed to have more moss about their external structure than this one; but though I found nests and young ones, I never again succeeded in getting the eggs."

From Murree, Colonel C. H. T. Marshall writes:—We were unlucky with this bird's nest, as the first one we found was a new one, and the climber stupidly destroyed it; the next one had young ones. They breed very high up in the Himalayan spruce-fir. Captain Cock got three eggs last year in Cashmere. They are white, beautifully marked with broad longitudinal dashes of light and deep rufous brown at larger end. They are 1·05 long and 0·8 broad. These birds breed at high elevations, never under 7000 feet."

He subsequently wrote:—"Captain C. B. Cock sent me six eggs of this species which he found high up in the spruce-firs on the Murree and Abbotabad road near Doongagully. The eggs were taken on the following dates:—

"2 fresh eggs, May 31st.

"2 " June 6th.

"2 " June 8th.

"The lengths vary from 0·9 to 1·07, but there is no appreciable

difference in the breadth, which is 0.77 to 0.81. The two most stumpy ones have the clouded zone round the smaller end, and on another egg the markings so graphically described by Mr. Hume do not form a zone, but entirely cover the large end."

Major Wardlaw Ramsay says, writing of Afghanistan:—"I shot a male specimen, one of a pair, on the Peiwar range at about 9000 feet . . . The pair was evidently breeding."

Mr. Brooks thus describes the eggs:—"Texture smooth and similar to that of the English Hawfinch's egg. In shape the egg is broad and rapidly diminishes towards the small end. There is a slight gloss on the egg. Ground-colour pale greenish grey, with a very few blackish-brown spots over the whole surface, and at the larger end, and very near the end, is a zone of lines and spots of the same dark umber-brown, intermixed with some dark grey-coloured lines and spots of a Bunting-like character. Some eggs of the English Hawfinch in character strongly resemble the eggs of this kind, both in ground-colour and mode of marking."

The egg is at present one of the very rarest in our collections, so I add also my own description.

The eggs of this species, to judge from the specimen I possess, given me by Mr. Brooks and taken by Captain Cock, are a very pale greenish grey or greyish white tinged with green, with numerous blackish-brown tangled lines, some thick and bold, some very fine, twisted about and intertwined in a small zone immediately about the large end, all more or less underlaid by faint inky-purple clouds. Besides this zone a very few blackish spots and one or two streaks appear on other portions of the egg's surface, but these are very few and far between.

The egg measures 1.03 by 0.8 inch.

Subfamily FRINGILLINÆ.

745. *Pyrrhula aurantiaca*, Gould. *The Orange Bullfinch*.

Pyrrhula aurantiaca, Gould, *Jerd. B. Ind.* ii, p. 390; *Hume, Rough Draft N. & E.* no. 732.

I know nothing personally of the nidification of the Orange Bullfinch. Captain Cock says:—"I shot this bird in the Sonamerg Valley (Cashmere) in June. They were then in pairs and evidently just about to breed. I did not succeed in taking their nests owing to my time being so limited, and the following year, when I wished to enter Cashmere to continue my observations from the end of June, where I had left off, to the end of August, I could not go because I could not get a pass, there being none available. Had I been a loafer or anything else than a British officer, no one would have gainsayed my going."

753. *Pyrrhospiza punicea*, Hodgs. *The Red-breasted Rose-Finch.*

Pyrrhospiza punicea, Hodgs., *Jerd. B. Ind.* ii, p. 406; *Hume, Cat.* no. 747.

The late Dr. Stoliczka remarked that this Finch "comes only occasionally in winter to Koteghur and Simla, but is more common eastwards; in summer it is found in Spiti and Ladak on elevations of 13,000 to 17,000 feet, searching after food at the camping-grounds. I found the nest, made of coarse grass, in Rupshu, near the Thsomoriri (lake) on the ground, in a little bush of the Tibetan furze; eggs dirty white or greenish, with some dark brown spots."

754. *Propasser thura* (Bp. & Schl.). *The White-browed Rose-Finch.*

Propasser thura (Bp.), *Jerd. B. Ind.* ii, p. 401; *Hume, Cat.* no. 740.

Mr. Mandelli sent me a nest of this species, taken on the 1st August in the Dolaka district of Nepal, at an elevation of about 12,000 feet. It was placed on a thorny bush at a height of about 6 feet from the ground, and contained three fresh eggs. The nest is an extremely regular and compact cup 4 inches in diameter and 2 in height exteriorly; it is mainly composed of fine grass-stems, but very little of this is seen, as it is completely coated outside with brown moss and very fine black moss and fern-roots, and it is warmly lined with white hair, the fur of some animal; the cavity measures 2 inches in diameter, and a little over 1 in depth.

A single egg sent me by Mr. Mandelli very much recalls the eggs of *Carpodacus severtzovi*, but is smaller and greener. In shape the egg is a very regular, rather elongated oval. It has only a very faint gloss. The ground-colour is a uniform pale bluish green, and about the large end it has a very few minute specks of a very fine hair-like character, and three tiny rings about the size of a pin's head. These are the only markings, and they are black or nearly so.

Two eggs, also found on the 1st August, have the ground-colour of a dull greenish blue; the one egg has a few good-sized spots and some specks of brownish grey scattered round the broad end, the other has five or six tiny specks of the same colour on different parts of the egg. A third egg, brought from Native Sikkim along with one of the parent birds, has a clearer ground-colour, and the markings consist only of a few almost invisible specks of the palest reddish brown, confined to the broad end of the egg. They measure 0.91 by 0.68 inch, 0.86 by 0.64, and 0.85 by 0.61.

755. *Propasser pulcherrimus*, Moore. *The Beautiful Rose-Finch*.

Propasser pulcherrimus, *Hodgs., Jerd. B. Ind.* ii, p. 402; *Hume, Rough Draft N. & E.* no. 743.

All that we know of the nidification of the Beautiful Rose-Finch is that Mr. Hodgson figures a beautiful, deep, cup-shaped nest as belonging to it, placed amongst a clump of close-growing twigs, and composed of fern-leaves and grass. He gives the exterior dimensions as diameter 3 inches, height 4.75; the interior as diameter 2 inches, depth 2.12. He neither describes nor figures the egg, nor is the date on which the nest was obtained noted.

761. *Carpodacus erythrinus* (Pall.). *The Common Rose-Finch*.

Carpodacus erythrinus (Pall.), *Jerd. B. Ind.* ii, p. 308; *Hume, Cat.* no. 738.

Colonel John Biddulph writes regarding the breeding of this Finch in Gilgit:—"Several nests were found, all situated within a foot of the ground, either in low bushes or among the stems of coarse grass about 2 feet high in scrub-jungle. The nest is a neat cup-shaped structure of grass, lined with the drier roots and stems only, except in one instance, in which a good deal of hair is mixed with the lining; the interior is from 2 to 2½ inches wide and 1½ deep. The eggs are blue, of a purer and slightly deeper shade than those of *Trochalopteron lineatum*, with chocolate spots sparingly scattered over them, chiefly towards the large end. In one out of a dozen the spots are almost entirely wanting; in some they are paler, almost of a sienna tint, in others nearly black, while on a few there are also one or two pale purplish spots and fine reddish scrawls at the larger end; and in these the spots are almost confined to the larger end in an ill-defined zone or cap.

"Nests were taken at 10,000 feet elevation on July 16th, 17th, 20th, 21st, 29th, and 30th, all with eggs mostly fresh."

Major Wardlaw Ramsay says, writing of Afghanistan:—"A male shot at Shalofyan, in the Kurum valley, was apparently breeding; for the testes were much enlarged."

The eggs of this species vary in shape from regular to broad ovals, but all are a good deal pointed towards the small end; the shell is very thin and smooth, but there is very little gloss on them. The ground-colour is a pale clear blue, the markings few and almost wholly confined to the broad end: in three of my specimens there are a few good-sized spots, a number of specks, and a few hair-like lines of deep blackish brown and black; on another egg the markings are of a deep purplish brown, some of the larger spots being surrounded by an indistinct halo, and there are besides some underlying markings of pale inky purple, which, together with the primary markings, form a ring round the large end; another egg, again, has only a few indistinct specks and spots

of pale reddish brown round the large end. These five eggs vary in length from 0.77 to 0.85. and in breadth from 0.59 to 0.61.

The eggs were procured in Gilgit, high up the Sind valley.

762. *Carpodacus severtzovi*, Sharpe. *Severtzoff's Rose-Finch*.

Carpodacus rubicilla (Guld.), *Jerd. B. Ind.* ii, p. 397; *Hume, Rough Draft N. & E.* no. 737.

Dr. Stoliczka gave me a warm lining of a nest, composed chiefly of goat's hair with a little fine vegetable fibre intermingled, and with it a note recorded at the time, stating that this, with the four eggs which it contained, had been found at Ankhang, a camping-ground in the province of Rupshu in West Thibet, at an elevation of 14,000 to 15,000 feet below the Parang Pass, on the 7th July, 1865. He was not quite sure what species the eggs belonged to, but he knew it was one of the Rose-Finches, and that he had preserved one of the parents. Now, the only one of the Rose-Finches whose nest he refers to in his ornithological observations on the Sutlej Valley, published in the *Journal Asiatic Society*, 1868, p. 60, is that of a species which he identified at the time as *Pyrrhospiza punicea*.

He says:—"I found the nest made of coarse grass in Rupshu, near the Tomourie Lake, on the ground in a little bush of Thibetan furze: eggs greenish, with some dark brown spots."

There can be no doubt that this nest is the one he gave me, but looking to Von Pelzeln's remarks on Stoliczka's birds (*Ibis*, 1868, p. 318), it would appear that the birds that he took for *Pyrrhospiza punicea* were really *Carpodacus severtzovi*, the specimens of which came from this very Ankhang below the Parang Pass, where the original note, still in the nest, says that it was found, and "one of the parents stuffed." I think, therefore, there can be no reasonable doubt as to the authenticity of the nest or eggs. The nest was doubtless made entirely of coarse grass and warmly lined with the lining now in my possession. The eggs are moderately elongated oval, rather pointed towards one end. The shell is smooth and fine, but has only a very slight gloss. The eggs are a pale greenish blue, with a few good-sized spots and many tiny specks of black or blackish brown, confined entirely to the broader half of the eggs.

The eggs vary from 0.96 to 1.0 in length, and from 0.67 to 0.7 in breadth.

768. *Callacanthus burtoni* (Gould). *The Red-browed Finch*.

Callacanthus burtoni (Gould), *Jerd. B. Ind.* ii, p. 407; *Hume, Rough Draft N. & E.* no. 748.

Of the nidification of the Red-browed Finch I know nothing myself. The late Captain Cock remarked:—"I observed this bird building in pine-trees at Sonamerg (Cashmere) in June, but

alas! I had to leave ere the eggs were laid. It makes rather a large nest of moss, lined with roots and stalks of fern, placed on the fork of one of the smaller boughs in a pine in dark forest situations."

770. *Acanthis brevirostris* (Gould). *The Eastern Twite.*

Linaria brevirostris (Gould), *Hume, Cat.* no. 761 bis.

An egg of this species, found in Native Sikhim on the 7th July, is a regular oval, slightly compressed towards the small end. The ground-colour is a spotless white with a faint bluish tinge, and the egg is mottled and spotted all over, most densely towards the broad end, where the spots have a tendency to form a zone, with reddish-brown and underlying markings of a paler shade.

The egg measures 0.72 by 0.55.

771. *Metoponia pusilla* (Pall.). *The Gold-fronted Finch.*

Metoponia pusilla (Pall.), *Jerd. B. Ind.* ii, p. 410; *Hume, Rough Draft N. & E.* no. 751.

Dr. Stoliczka tells us that "the Gold-fronted Finch comes only in winter to the lesser ranges of the North-west Himalayas. It breeds east of Chini, at elevations of 10,000 feet and above, as likewise in Spiti, Lahul, and Ladakh. I found old nests made of thin twigs, laid out with grass and wool, on shrubs or low trees of *Juniperus excelsa*."

Colonel John Biddulph writes from Gilgit:—"On July 28th I had a nest brought me which my shikari had been watching several days. He shot one of the pair of old birds about the nest, which turned out to be the male of *M. pusilla*. The nest contained three eggs, perfectly fresh (and the number was apparently not complete), in colour a dull stone-white, with small red-brown spots dotted about the larger end. The nest was about 20 feet from the ground, in a cedar-tree (*Juniperus excelsa*), neatly made of grass-fibres, and lined thickly with sheep's wool, and matted on the outside with soft bits of decayed wood so as to look like bark of a tree."

Major Wardlaw Ramsay says, writing of Afghanistan:—"Plentiful in the Hariab district, and remained in flocks until the early part of June, when they commenced to breed. I found a nest on the Peiwar range, which was placed near the extremity of a deodar branch about 4 feet from the ground; it was composed of dried weeds and strips of bark, and lined with feathers and goat's hair. Only one egg was in the nest, of a delicate bluish white, speckled at the thicker end with minute reddish-brown spots."

An egg of this species, procured in Gilgit, is a regular oval, slightly pointed towards the lesser end; the shell is very thin and fine, but has almost no gloss. The ground-colour is a delicate bluish white, and the markings, which are gathered in a zone round the

large end, consist of a few blackish spots and a number of specks and streaks of reddish brown.

The egg measures 0·65 by 0·49.

772. *Hypacanthis spinoides* (Vigors). *The Himalayan Greenfinch.*

Chrysomitris spinoides (Vig.), *Jerd. B. Ind.* ii, p. 409.

Hypacanthis spinoides (Vig.), *Hume, Rough Draft N. & E.* no. 750.

The so-called Indian Siskin is not a Siskin at all, neither in note nor in shape of bill, and is certainly not a *Chrysomitris*. The note is very like that of a Greenfinch, but structurally our bird is not a *Chloris*; and it seems to me that either one must unite the whole of the true Finches under one genus, *Fringilla*, or one must separate the present species as a distinct genus and adopt, as I have done, Cabanis's name, *Hypacanthis*.

Although this bird breeds very freely in all well-wooded hills in the interior of the Himalayas, at elevations of from 4000 to 7000 feet, I seem to be the only person who has taken the nest in recent times.

The following is a note that I recorded at a time when I had recently taken several nests:—

“Lays in July and August, at least in the neighbourhood of Simla, where alone I have found its nest. The latter is placed in very various situations, and always so well concealed that, except by watching the birds early in the morning when both parents are generally feeding in the neighbourhood of the nest, it is almost impossible to discover it. I have found the nest (August 18th) with three young ones, some 30 feet from the ground, nearly at the top of an evergreen oak, and I have found it in a deodar bush not 3 feet from the ground on the lowest bough, about 6 inches from the main stem. Once I found it against the trunk of an aged deodar, nearly buried in a huge clump of moss, much of which the birds had attached to the sides of the nest. Usually the nests are seated *flat* on some bough or wide-spreading fork, and, as far as my experience goes, this bird prefers the deodar to any other tree. The nest is a most beautiful structure, cup-shaped, woven of the finest grass-roots, with a good deal of hair interwoven in the interior and with much moss blended with the exterior. It is a very solid and compact little structure. The cavity, which is generally truly circular, varies from 2 to 2·5 inches in diameter and from 1·1 to 1·4 in depth. Exteriorly the diameter of the real nest does not exceed 4·5, and often falls short of this; but the nest is at times so blended with moss *in situ* that it is difficult to say where the nest ends, and you may have to tear away a patch 9 inches square to get it. The eggs are usually three in number, and when fresh are a delicate, slightly *greenish* white, with an irregular ring of minute blackish-brown spots round the large end, and occasionally a very few similar specks on the body of the egg. The shell is

exquisitely fine and delicate, and the yolk shows through quite plainly. It is this that gives a certain greenish tinge to the unblown egg, for when blown the shell is a very delicate pale bluish white. In shape they are moderately broad ovals, considerably pointed at one end."

Mr. Hodgson's notes inform us that our Indian Siskin breeds in the central hilly region of Nepal from April to July. Its nest is built in open forests or groves, between three or four slender branches, and is compact and cup-shaped, composed of moss and moss-roots, and closely lined with the latter. One nest, of which he gives the dimensions, measured externally 3·5 in diameter and 2 inches in height, internally 2·1 in diameter and 1·1 in depth. The eggs, he says, are three or four in number; the one he figures is a very regular broad oval, measuring 0·75 by 0·59, a uniform pale green, *unspotted*: all I have ever found were spotted. Above I have given the description that I wrote when I took the eggs; below I subjoin an exact description of them as they now appear in my collection. They have slightly changed colour.

The eggs are oval, slightly pointed towards the small end; the shell is delicate and glossless; the ground-colour is a very delicate pale sea-green, and the only markings are a number of black specks, almost without exception contained within a broad zone at the large end. One egg, besides these black specks, has intermingled with them very faint reddish-purple specks. I have never seen the egg of the European Siskin, but the figure of it in Mr. Hewitson's 3rd edition does not appear to me to resemble very closely those of our bird.

In size they vary from 0·66 to 0·75 in length, and from 0·51 to 0·55 in breadth; but 0·69 by 0·52 is, I think, an average dimension.

775. *Gymnorhis flavicollis* (Frankl.). *The Yellow-throated Sparrow.*

Passer flavicollis (Frankl.), *Jerd. B. Ind.* ii, p. 308.

Gymnorhis flavicollis (Frankl.), *Hume, Rough Draft N. & E.* no. 711.

The Yellow-throated Sparrow breeds pretty well throughout India, except in the extreme south, and again in Orissa and Bengal proper. From Behar to Sindh, and from Dehra Dhoon at any rate to Bangalore, it may be found nesting, I believe; but the bird is unfortunately so common that few of my correspondents have thought it worth while mentioning it. In the Himalayas west of the Beas it occurs up to elevations of 4000 or 5000 feet.

In the plains it breeds in April and May; in the hills about Murree, according to Colonel C. H. T. Marshall, in July.

I have taken scores of nests of this species; all were, without exception, placed in holes in trees. Old mango-trees, for instance, are very often chosen, and in these the nests may be found at 30 feet from the ground, though usually they are at heights of

from 12 to 20 feet; sometimes some old stub is patronized, and then the nest may not be a couple of feet from the ground. On one occasion I found a nest in a hole in a stem of an old heens bush (*Capparis aphylla*), which stem was barely 5 inches in diameter.

The nest is generally only a little bundle of dry grass, thickly lined with feathers. It is in a mangrove-grove much frequented by the Common Green Paroquets, the feathers of these latter are sure to be those chiefly used. Sometimes, however, a more or less cup-shaped nest is formed, fine strips of bark and tow being added to the grass; and, again, at times it is a regular pad of hair, tow, and wool, with a few feathers, all closely interwoven, and with only a little central hollow.

I never found more than four eggs, often only three fully incubated ones, but more may occur.

Mr. E. M. Adam writes to me that he "found a nest of this bird in a mango-tree in Oudh on the 4th May; it contained only one fresh egg."

Dr. Jerdon says:—"It breeds in holes in trees, and in some parts of the country in the roofs of houses, in the hollow bamboos of the roofs, and occasionally in pots hung out for the purpose. The eggs are three or four, greenish white, much streaked and blotched with purplish brown.

Writing of Rajpootana in general, Lieut. H. E. Barnes tells us that "the Yellow-throated Sparrow breeds during April and May in holes in trees."

Major C. T. Bingham remarks:—"This Sparrow breeds at Allahabad in March and April, and at Delhi in June. Although it cannot strictly be said to breed in colonies, still I have found more than a dozen nests in one immense peepul tree. It builds in holes in decayed branches of trees, lining the interior with a little straw and feathers. The usual number of eggs is, I think, three. I have only once found four, and a few times two hard-set ones."

Colonel E. A. Butler writes:—"The Yellow-throated Sparrow is very common at Mount Aboo, and breeds there in April. I have taken many nests and found them usually in holes of trees at no great height from the ground. On the 14th April this year I took a nest from a hole in the branch of a mango-tree about 6 feet from the ground, containing four fresh eggs. The nest was composed externally of dry grass, and internally of fowl's feathers and cow's hair."

And he adds the following note from Sind:—"Hydrabad, Sind, 15th April, 1878. A nest built in a hole of one of the mud walls of my verandah, about 12 feet from the ground, containing four much-incubated eggs. Another nest on the 1st May, near the same spot and in a similar situation, contained three hard-set eggs, and another on the same date inside the top of an old lamp-post.

"The hole by which the bird entered was in the bulb at the top."

of the post upon which the lamp rests, and was so small that the hen bird had some difficulty in passing in and out. The heat during the day inside of the post must have been almost unendurable, which would account for the old bird seldom being found on the nest. I may add that the lamp was lit regularly every evening and burnt all night. Subsequently I found several other lamp-posts in camp occupied by a pair of these Sparrows.

"On the 3rd May I took three incubated eggs from a nest in a hole of a mud-wall; and on revisiting the nest on the 10th May I found it contained three more fresh eggs."

Mr. J. Davidson, writing on the birds of Western Khandesh, says:—"It is the commonest bird in the Satpuras, breeding in the hot weather. Out of at least a dozen nests of which I have notes, in only one case was there more than two eggs."

And this gentleman and Mr. Wenden further remark:—"Rare, but Davidson found it breeding in the Sholapoor Districts in April."

The eggs are dull and glossless, moderately elongated ovals, sometimes pointed towards the little end, sometimes blunt and pyriform. Considering how nearly equal in size the two birds are, it is surprising to find that the eggs of this species average in weight little more than half those of *P. domesticus*. The ground-colour, where any of it is visible, is greenish white. The eggs are very thickly streaked, smudged, and blotched all over with dingy brown, usually more nearly a mixture of sepia and chocolate-brown than any other shade I can think of. In some eggs the markings are entirely confluent all over, so as to leave no particle of the ground-colour visible, and in all the eggs I have seen they were so thick as to leave but little of this visible. The very dark dingy appearance of these eggs is their chief characteristic.

The eggs vary less in size than those of the House- and Tree-Sparrows, and are considerably smaller than either. In length they vary from 0.66 to 0.78, and in breadth from 0.52 to 0.56; but the average of thirty-four eggs is 0.74 by 0.55 nearly.

776. *Passer domesticus* (Linn.). *The House-Sparrow*.

Passer indicus (J. & S.), *Jerd. B. Ind.* ii, p. 362, *Hume, Rough Draft N. & E.* no. 700.

It was with extreme hesitation that I followed "my betters" in assigning a distinct specific title to our Indian House-Sparrow in the former edition of this work. Between ourselves I don't believe in its distinctness. I have some "truly rural" French and English Sparrows—none of your London or Newcastle, black-country, or manufacturing districts street Arabs, but real, unsophisticated rosy peasants that match some of our Indian birds fairly.

But what is in a name? Call him *domesticus* or *indicus*, it doesn't alter his depraved nature, does not make him one whit less

detestable—only there is a certain *lucus a non lucendo* sarcasm involved in the Linnean name that aggravates.

If domesticity consists in sitting upon the punkah-ropes all day, chit, chit, chit, chattering ceaselessly when a fellow wants to work, banging down in angry conflict with another wretch on to the table, upsetting the ink, and playing old Harry with everything, strewing one's drawing-room daily with straw, feathers, rags, and every conceivable kind of rubbish in insane attempts to build a nest where no nest can be—if I say these and fifty similar atrocities constitute domesticity, heaven defend us from this greatly-lauded virtue, and let us cease to preach to our sons the merits of *domestic* wives! Conceive a wife evincing similar tendencies! Why, there isn't a jury in the country who would not return a verdict of "sarve her right," even if the unhappy husband should have wrung her neck before the golden honeymoon had run out.

Now, everybody does or ought to know all about the nidification of Sparrows, and all I mean to say is that their nests are shapeless bundles of straw, grass, rags, wool, or anything else they can lay their bills or feet on, thickly lined with feathers, stuffed into any holes or crevices about huts, houses, walls, old wells, &c. that they can find, and even, though rarely, into the centre of some thick bush. They lay five or six eggs, sometimes even more, and have two or more broods during the year.

As to season this varies somewhat, but from February to May are mostly the months "when sparrows build." If you require further particulars, "circumspice!" My one regret has ever been that the whole race had not before my time met, under Providence, that appropriate doom so graphically depicted in Mr. Yarrell's charming woodcut.

Mr. Benjamin Aitken writes:—"I am sorry to read what you have written about the Sparrow, for I like *Passer domesticus*, and willingly overlook its disorderly habits in admiration of its intelligence, courage, patience, and care for its young. As a pet, too, it has no superior, and only one or two equals, among the feathered tribes. The noise that you so much object to is not the poor bird's fault. With such voice as he has does the cock Sparrow devote many a weary hour to cheer his mate on her nest, exhibiting a patience and devotion that is equalled only by the 'wakeful Nightingale'; and if it be but 'tuneless melody' he pours forth, it sounds far sweeter, I have no doubt, to Mrs. Sparrow than all the hurried snatches of song with which the Bulbul, Thrush, Black-bird, Robin, and Lark put off their uncomplaining mistresses.

"With regard to the breeding-season of the Common Sparrow, I have certainly found as many, perhaps more, nests in July and December than 'from February to May.' I have records of their nests in January, March, April, May, July, September, October, and December.

"However extraordinary the place pitched upon for a Sparrow's nest may be, it is, one would say, invariably in a recess of some kind; but I have seen a large handsome nest between a pair of deer's horns fixed up on the wall of a fashionable drawing-room,

where, *when completed*, it was considered a curious ornament. Till then, however, the drawing-room was perpetually like a stable, from the quantities of straw deposited on the carpet. The wonder is that the nest was ever built on its site at all, for there was no deer's head with the horns, and it did not seem possible that the nest could have come there except by being constructed on some foundation, and then, when complete and compact, being placed between the horns.

"A favourite place for Sparrows to build in Bombay is in the globe-shaped hollow at the top of the iron posts of the street lamps, exactly under the glass shade. The hollow is commodious enough, and the neck or mouth is narrow, so the place is admirably adapted for the Sparrow's purpose, but must be like a furnace during the heat of the day. Besides, a man goes up twice every day to clean and attend to the lamp, and remains for a minute or two bustling and fumbling about within 4 inches of the nest. Then, again, the gas is blazing all night with a glare that would astonish any bird more susceptible than *Passer domesticus*."

The eggs exactly resemble those of our English House-Sparrow, but possibly average smaller. They are typically somewhat elongated ovals and but little pointed, but, as in all other species, varieties occur, and broad oval eggs, pointed and pyriform ones, are seen. The ground-colour is either greenish, greyish, or yellowish white, or sometimes a pale stone-colour. The markings are most commonly close frecklings, fine striae, or smudgy streaks; but in a certain number of eggs the markings are spots, specks, and blotches pretty sharply defined. The colour of the markings varies—sometimes sepia-, sometimes olive-, sometimes yellowish, and sometimes purplish brown; whichever shade it be, it is generally dull and dingy; and besides these primary markings many eggs exhibit pale inky-purple clouds and spots, which seem to underlie the brown markings. I have one egg which I took near Jodhpoor—a uniform pale fawn or stone-colour, with, for its only markings, a long, fine, intricately jagged black line near the big end, such as one often sees on the eggs of the Yellowhammer. As a rule the eggs have very little gloss, but here and there one somewhat more glossy may be met with. In, I think, about half the eggs there is a more or less marked tendency to form a blotchy, mottled, ill-defined cap at the large end, and in some this is very conspicuous.

In some birds whose eggs as a body vary excessively, you at any rate find all the eggs of each clutch of the same type. This, however, is not at all the case with Sparrows; on the contrary almost every clutch contains at least two types—a very light and a very dark one.

The eggs vary very much in size, in length from 0.6 to 0.88, and in breadth from 0.58 to 0.65; the average, however, of fifty-seven eggs is 0.81 by 0.6*.

* I have omitted numerous notes that are scattered throughout 'Stray Feathers' regarding the nidification of the House-Sparrow, as Mr. Hume and Mr. B. Althen appear to have said all that is necessary on the subject.—Ed.

777. *Passer pyrrhonotus*, Blyth. *The Rufous-backed Sparrow.*

Passer pyrrhonotus, Bl., *Jerd. B. Ind.* ii, p. 365; *Hume, Cat.* no. 709.

Mr. Scrope Doig writes to me:—"I send three eggs of *Passer pyrrhonotus* taken on 24th April, 1881; nest a loose straggling kind of structure of grass and feathers, generally situated close to water in acacia trees: normal number of eggs three. The three herewith sent represent the different types I have taken up to the present. The birds are just beginning to build, and are very far from being rare."

He elsewhere remarks:—"25th August. While beating some tamariak bushes in the middle of a swamp for *A. stictoreus*, I shot a bird I did not recognize, and which I had noticed fly past me two or three times towards some small acacia trees growing in the water. On going to these trees I found three nests exactly similar to nests of *P. domesticus*, only rather smaller, placed in the top-most branches, and about 12 feet over water-line. All the nests had young ones more or less fully fledged."

The eggs vary a great deal in markings, as do those of all the Sparrows; but they are regular Sparrows' eggs, all the varieties of which could be exactly matched by eggs of the Common Sparrow, except, indeed, as regards size, for they are markedly smaller. There are three very marked types and a dozen intermediate subtypes; one has a clear greenish-white ground, and is profusely blotched in a zone round the large end with brownish olive, blotches of the same colour being sparsely scattered over the rest of the surface of the egg; the second has a creamy-fawn coloured ground, densely but finely freckled all over with sepia-grey; the third has a greyish-white ground, very little of which is visible, and then chiefly on the smaller half of the egg, densely mottled and striated with blackish brown, which all about the larger end of the egg forms a confluent mottled cap.

Three eggs measure from 0·68 to 0·7 in length, and from 0·5 to 0·51 in breadth.

779. *Passer montanus* (Linn.). *The Tree-Sparrow.*

Passer montanus (Linn.), *Jerd. B. Ind.* ii, p. 366; *Hume, Rough Draft N. & E.* no. 710.

I know little of the nidification of this, the Tree-Sparrow of European writers, except in British Sikhim, where it appears at elevations of from 3000 to 7000 feet during the summer, and where it breeds about all human habitations during the spring and summer, making a nest precisely similar to that of the Cinnamon Tree-Sparrow, and laying from four to six eggs. I have ascertained that these Sparrows rear at least two broods during the summer. In Burma the bird breeds we know, and throughout the Himalayas east of Nepal; but though it occurs as far west as Ohini in the Sutlej Valley, I have not heard of its breeding west of Nepal.

Mr. Gammie says:—"This species breeds freely about our houses in Sikhim. There are always nests about the eaves of the houses. The nest I send you was taken on the 18th May in my house at Mongphoo; elevation 3500 feet. It contained five partially-incubated eggs, four of which I send."

Again, writing on the 24th July, he remarks:—"I see *Passer montanus* now building for at least their second brood. For the first brood they began early in March. The old ones are still feeding their young, which are flying about quite as well as their parents."

The nest is a huge warm cup, at least huge for the size of the eggs, exteriorly 6 inches by 4·5, and nearly 2 inches in height, with a cavity 3 inches by 3·5 and 1·5 deep. Interiorly it is very closely and smoothly and softly lined with feathers. Round this is a quantity of tow or similar soft vegetable fibre, while exteriorly the nest is composed of more or less coarse grass-blades and stems.

Dr. Scully writes:—"This is the Common Sparrow of the Nepal Valley, a permanent resident all over the central level parts; it is also common in winter in the Chitlang and Markhu Valleys. In the great valley its breeding-season lasts from March to the end of July, and it rears certainly two, and often three broods. I obtained nestlings on the 16th April, and eggs as late as the middle of July."

Lieut. H. E. Barnes records the following note from Afghanistan:—"The Tree-Sparrow is a resident, and occurs, especially in the cold weather, in great numbers; but as the weather gets warmer it is not noticed so often, retiring probably further into the hills to breed. I have only succeeded in obtaining a single egg, and this was taken from a hole in a tree. The egg does not differ much from that of *Passer domesticus*."

Writing of this species from Pegu, Mr. Oates remarks:—"This bird is commoner than *P. indicus* in the valley of the Sittang River. In Rangoon it appears to be the only House-Sparrow. Its nest and eggs are not distinguishable from those of *P. indicus*, and it breeds in the same sites."

I cannot quite agree with this. The eggs vary as all Sparrows' eggs do, but as a body they more nearly resemble those of *G. flavirostris* than of *P. indicus*. The ground-colour is white, greyish, or brownish white. Some are speckled and spotted, some blotched, smeared, and streaked, some sparingly but the majority densely, with varying shades of brown and greyish lilac, the markings being generally densest and darkest in a zone or cap towards the large end. Typically the markings are, I think, blurred, smeared, and indistinct, leaving little of the ground-colour visible, but occasionally the spots are brighter coloured, sharply defined, and comparatively few in number. The eggs before me vary from 0·67 to 0·82 in length, and from 0·48 to 0·58 in breadth, but their average is 0·73 by 0·54.

789. *Passer cinnamomeus* (Gould). *The Cinnamon Tree-Sparrow.*

Passer cinnamomeus (Gould), *Jerd. B. Ind.* ii, p. 365; *Hung, Rough Draft N. & E.* no. 708.

The Cinnamon Tree-Sparrow breeds throughout the Himalayas from Murree to Nepal, at elevations of from 4000 to 6000 or even 7000 feet. Further east it occurs, though as a straggler, but I have no record of its breeding there.

It lays in May or June, making typically a large loose nest, composed of dry grass and plentifully lined with feathers, in some convenient hole in a decaying tree or branch at no great elevation from the ground. Occasionally it builds under the eaves of houses, in the walls of sheds, and, as Colonel Marshall tells us (I have never myself seen this), in deserted Swallows' nests. In the same way the Common Tree-Sparrow, normally, I should suppose, a tree nester, has in parts of Europe, as well as in the Eastern Himalayas and Burma, become more or less of a House-Sparrow in its nidification.

As a rule the nests are ragged and shapeless externally (more or less filling up the entire hole in which they are placed), with a rather deep, central, circular cavity.

Four is the usual number of eggs, but I have often found five, and once as many as six. This bird breeds in great numbers about Kotegurh, but rarely more than one pair is found in one tree or about the same house. A hundred nests may be found within a radius of a quarter of a mile, but they do not cluster together into Sparrow-towns as the Willow-Sparrows do.

Sir E. C. Buck, C.S., writes:—"On the 15th June at Shah, between Saran and Goura, I found a nest of the Cinnamon Tree-Sparrow containing four fresh eggs. The nest was a broad loose cup of dry grass, lined with feathers, some 6 inches in diameter externally. It was placed in a hole in a thick branch about 12 feet from the ground."

From Dhurmsala Captain Cock remarks:—"This is a common bird here; usually breeds at an elevation of from 4000 to 5000 feet. It always breeds in hollow trees, especially in the rhododendron, and makes a large nest of grass lined with feathers after the usual Sparrow fashion. It lays four eggs, smaller than those of *Passer domesticus*. It breeds in May and June. The nest is usually at a low elevation from the ground, say between 4 and 10 feet."

From Murree we hear from Colonel C. H. T. Marshall that the Cinnamon Tree-Sparrow "lays in deserted Swallows' nests and about houses. At Dhurmsala this Sparrow always builds in trees out in the forests."

Colonel G. F. L. Marshall remarks:—"Breeds at Naini Tal at 7000 feet above the sea, most commonly in the eaves of verandahs and outhouses. I have taken fresh eggs in the middle of May.

It is a domestic bird in its habits there, and is quite common in the station, while out in the woods I have not noticed it."

In shape the eggs are typically very perfect, moderately-elongated ovals, scarcely compressed or pointed at either end. They vary a good deal in appearance; many closely resemble common varieties of those of the House-Sparrow, having the ground-colour white, greyish, or greenish white, more or less thickly speckled, spotted, streaked, or blotched with various shades of brown, chiefly sepia-brown. In this type of egg the markings are generally densest at the large end, where they are often more or less confluent, and even form a broad, irregular, mottled cap. Others again closely resemble the eggs of *P. flavirostris*, and are so densely streaked and smeared all over with sepia-brown as to leave little of the ground-colour visible. A third type has the ground-colour a faintly brownish grey, and exhibits a well-marked zone of dark sepia-brown about the large end, and only a few specks, spots, and streaks of the same colour scattered over the rest of the surface of the egg. In size they do not vary much, viz., only from 0.72 to 0.8 in length, and from 0.55 to 0.65 in breadth; but the average of twenty-eight eggs is 0.76 by 0.57.

It will be seen, therefore, that, as Captain Cock remarks, they average considerably smaller than those of the House-Sparrow.

781. *Passer flaveolus*, Blyth. *The Pegu House-Sparrow.*

Passer flaveolus, Bl., Hume, *Rough Draft N. & E.* no. 708 bis.

Writing from Thayetmyo, Mr. Oates remarks:—"The Pegu House-Sparrow is nearly as common as *P. domesticus*. It is, however, more of a Bush-Sparrow, generally building its nest in trees; one pair indeed built a nest in my house, but as soon as it was finished the birds left the place."

He subsequently remarked that he found a nest of this Sparrow in the roof of the verandah of the Wanetkone bungalow, in Southern Pegu, in March with young birds.

785. *Montifringilla adamsi*, Moore. *Adams's Mountain-Finch.*

Montifringilla adamsi, Moore, Hume, *Rough Draft N. & E.* no. 762 ter.

Dr. Adams tells us that he found his Mountain-Finch "common on the bare and barren mountains of Ladakh and Little Thibet, and feeding on the seeds of the few plants found in these desolate and dreary-looking mountains. Its cry is like that of a Lark, and its habits on the ground are very similar. The nest is composed of grass, and generally placed in the long dykes, built by the Tartars over their dead, so frequently to be seen in that country."

Subfamily EMBERIZINÆ.

790. *Emberiza fucata*, Pall. *The Grey-headed Bunting.*

Emberiza fucata, Pall., *Jerd. B. Ind.* ii, p. 375.

Citrinella fucata (Pall.), *Hume, Rough Draft N. & E.* no. 719.

The Grey-headed Bunting breeds throughout the valleys of the Sutlej and Beas, and the hills westwards of this to Hazara, at elevations of from 6000 to 8000 feet.

It lays from the middle of May to the middle of July, so far as I yet know, and very possibly both earlier and later.

The nest is usually placed on the ground, at the root of some little dense tuft of grass or stunted bush, or under some large stone well concealed by the surrounding herbage; but I have had one nest brought to me said to have been found in a bush nearly a cubit from the ground.

The nest is saucer-shaped, or, perhaps I should rather say, shallow cup-shaped, composed almost entirely of dry grass, and lined with very fine grass-stems and a little hair. It is perhaps a neater and certainly a denser and heavier nest than that of *E. stracheyi*, but both are much the same size and very similar in other respects.

Four seems to be the regular complement of eggs.

Sir E. C. Buck writes:—"On the 25th June, 1869, I found a nest of the Grey-headed Bunting above Kotegurh. It was placed under a small furzy bush on the ground, and was constructed of dry grass, coarse and loose outside, fine and tolerably close inside. The exterior diameter was 4 inches, the interior diameter $2\frac{1}{4}$ inches, and the depth $1\frac{1}{4}$ inch. It contained three fresh eggs."

It has been remarked that "this species, which is one of the most curious of its genus, is distinguished from all the others by the length of the tertiaries, which cover the primaries throughout nearly their whole length, and by the claw of the hind toe being a little longer and less curved than ordinary, which latter circumstance, recalling to our minds the Larks, Pipits, Wagtails, and other birds which mostly frequent the ground, leads me to suppose that this Bunting differs in its mode of life from all the other members of the genus, which, as is well known, give the preference to trees. Pallas indeed says that it inhabits the islets and meadows of *Dauria*." Now the eggs of this species are by no means of the ordinary Bunting type. The only Bunting's egg of which I have seen a figure which they at all resemble is that given by Bree of the egg of the Black-headed Bunting (*Euspiza melanocephala*). Like the eggs of *Melophus melanicterus*, there is something of a Pipit and Lark-like character about them. In shape they are long regular ovals, somewhat pointed towards the small end. The ground-colour is a very pale greenish grey or white tinged with greenish grey, and they are speckled and freckled pretty well all over, but far more densely at the large end, where there is an

irregular mottled cap or zone, with dull, rather pale, somewhat reddish or purplish brown. They have little or no gloss, and in shape are more elongated and oval than those of *E. stracheyi*.

In length the eggs vary from 0.76 to 0.91, and in breadth from 0.57 to 0.62.

793. *Emberiza stewarti*, Blyth. *The White-capped Bunting*.

Emberiza stewarti, Bl., *Jerd. B. Ind.* ii, p. 374.

Citrinella stewarti (Bl.), *Hume, Rough Draft N. & E.* no. 718.

I have never found a nest of the White-capped Bunting, though I have had its eggs sent me from both Busahir and Kooloo, and I know that it also breeds in Cashmere and in the hills about Murree.

From this latter locality Colonel Marshall records that "the nest is roughly made of roots and fibres, situated in a low bush near the ground. The eggs, four in number, are dusky white, spotted and blotched with different shades of black and grey. Size 0.8 by 0.6. Breeds in the latter end of June, from 5000 to 7000 feet up."

Dr. Stoliczka tells us that this species "is very common about Chini and farther to the east (in the valley of the Sulej), making a nest of coarse grass near the ground in low bushes. I found young birds about the middle of June."

Captain Cock says:—"Of the White-capped Bunting I have found nests and eggs on the hills between Cashmere and Murree, and also in the station of Murree itself.

"It breeds in June and July, and the nest is always placed, according to my experience, by the side of some road or path, on the upper bank, upon the ground, and tolerably well concealed by overhanging grass. It is a rather deep cup, and usually contains three eggs of a greyish colour, with vinous blotches and clots, chiefly at the larger end."

Major Wardlaw Ramsay says, writing of Afghanistan:—"This Bunting began to breed towards the end of April; and during the months of May and June I found great numbers of their nests. They were almost all situated under roots on sloping banks or hillsides, and were composed entirely of dried grass. The eggs were generally four in number, but I have found five. They vary exceedingly, both in size and colour, in different nests—some sittings being pale blue thickly spotted with purplish brown, and with a few irregular Bunting-like blotches and dashes. In another nest the eggs were much larger, and coloured greyish white, profusely spotted and speckled with red-brown, and with the usual blotches deep purplish brown. . . . One pair built their nest within a few yards of my tent, which was on the outer edge of our camp at Bhan Kheyl, in the Hariab valley."

The ground-colour of the eggs is white, mottled and clouded all over with pale purple-grey or slaty-grey, for the purple tinge in some eggs is hardly perceptible. Above the grey or purple

markings are a few small, very dark brown, irregularly-shaped spots. Some of them are slightly inclined to be of a short, streaky, or Bunting character; but the majority are ordinary spots. The eggs vary in shape a great deal: some are short, broad, regular ovals; others elongated, and a good deal pointed towards the small end. The shell is fine, but there is only a mere trace of gloss.

In length the eggs vary from 0·72 to 0·8, and in breadth from 0·57 to 0·61; but the average of ten eggs is 0·78 by 0·59.

794. *Emberiza stracheyi*, Moore. *The Eastern Meadow-Bunting*.

Emberiza cia, Linn, *Jerd B Ind.* ii, p. 371.

Citrinella cia (Linn), *Hume, Rough Draft N. & E.* no. 813 (713).

Our Meadow-Bunting breeds throughout the Himalayas west of the Ganges, at elevations of from 4000 to 9000 feet.

Eastward of the Ganges I have no note of its occurrence, except as a very exceptional straggler in the lower valleys in the cold season.

The breeding-season lasts from April to August, but the great majority lay in May and June. The nest is always on the ground, commonly wedged in under some large stone, or inserted between the blocks of the rough stone walls with which the hillsides are terraced, but occasionally placed at the base of some dense tuft of grass or shrubby bush.

The nest is generally a shallow, loose, but pretty perfect cup, from 3 to 4 inches in diameter, externally composed of grass-stems, and lined with finer stems of the same and a few horse- or other animals' hairs or moss-roots. A nest of this species obtained near Kotegurh was a moderate-sized pad of grass, about 5 inches long by about 4 broad, and perhaps 2 inches in thickness. Towards one end of this was a beautiful little saucer-like cavity, perfectly circular, about 2 inches in diameter and 0·75 in depth, lined first with very fine grass-stems and then again, at the bottom of the cavity, with fine white hairs, but of what animal I am uncertain: they are much too fine for horsehair.

Four is, I think, the normal number of the eggs; but I have repeatedly found only three more or less incubated, and occasionally five.

This species is very common about Simla, and its eggs are almost as plentiful as those of *Trochalopteryx lineatum*.

Sir E. C. Buck writes:—"At Daren, near Soroon (in the valley of the Sutlej), I found a nest of the Meadow-Bunting on the 16th June. The nest was constructed of straw and dry grass, lined internally with fibres and animal hairs. It measured externally about 4·5 in diameter and 3·5 in height, and the cavity was about 2 inches in diameter and nearly the same in depth. It contained

when taken three fresh eggs, but when first found (on the 14th) there was only one. The nest was on the ground, wedged in under a large boulder."

Captain Beavan recorded:—"A nest was brought to me at Fagoodak bungalow on 4th August, 1866, containing two eggs, which have much of the colour of those of *Fringilla œlebs*, with markings as in *E. citrinella*—that is, they are of a pale pinkish-blue-green, with blotches and streaks of claret-colour. They measure .81 by .62. The nest is fairly made of grass, lined with hair, and was, I believe, found in a low thick bush."

At Murree Colonel C. H. T. Marshall tells us that he "found several nests in the middle of June in low bushes or banks."

Major Wardlaw Ramsay says, writing of Afghanistan:—"I found it breeding on the 19th June at the foot of the Peiwar Kotul, at about 8000 feet."

Colonel John Biddulph tells us that this species is "extremely common all the winter" at Gilgit, "but goes higher about the beginning of April, and breeds at about 8000 feet. I took two nests (second brood, no doubt) in the first week of August. Both were on the ground, under a stone. One had only one egg in it, the other three.

"I also took a nest with three fresh eggs in it on 1st June, at 9000 feet, and took two nests, each with three eggs quite fresh, on 23rd and 24th June."

The eggs of this species are typically moderately elongated ovals, perfect and regular in their shape; they have little or no gloss, and the ground is a very pale greenish white or grey or brownish stone-colour. Their markings consist of the most delicate and intricate tracery of fine dark brown (in some places almost black) lines drawn over faint and pale inky-purple streaks or marbling. Here and there a black or dark-brown spot, like a fly caught in a spider's web, is seen amidst the tangle of lines that so specially characterize the eggs of this species and others of the Bunting family. These lines, I may remark, are commonly mostly confined to the large end of the egg, where they form in some a tangled cap and in others a broad, irregular, but conspicuous zone. I do not think that Dr. Bree's figure of the Meadow-Bunting's egg conveys at all a good idea of the eggs of the Indian *E. stracheyi*; the lines are much too few in number, and too coarse and thick. Hewitson's figure of the Yellow-ammer's egg much more closely resembles our eggs; but even in this the lines are neither sufficiently numerous nor fine. Anything more elaborate or intricate than the labyrinth-like pattern of hair-lines exhibited by some of the eggs before me can scarcely be conceived. These very fine lines, and the manner in which they are disposed about the larger half of the egg, remind one forcibly of the very similar lines met with in the eggs of the little *Prinia inornata*. In size the eggs most closely approach those of the Cirl Bunting, and out of a very large series only one is as large as that figured by Dr. Bree. The eggs of our bird vary in length from 0.72 to 0.82, and in

breadth from 0·58 to 0·68; the average of fifty eggs is 0·83 nearly by 0·68*.

799. *Emberiza melanocephala*, Scop. *The Black-headed Bunting.*

Euspiza melanocephala (Gm.), *Jerd. B. Ind.* ii, p. 378.

Euspiza simillima, Bl., *Hume, Rough Draft N. & E.* no. 721.

I do not at all myself believe that this species breeds within our limits; but it is still worth while drawing attention to what Burgess says.

He mentions that "the patel, or head-man, of the town of Jintee, near the River Bheema, in the Deccan, assured me that these birds, or some of them, remain to breed in the thick babool-coppes that clothe the banks of the river near that town; but I did not observe the nests or eggs. I believe that the greater part migrate much about the same time as the Rose-coloured Pastor"†.

802. *Emberiza striolata* (Licht.). *The Striolated Bunting.*

Fringillaria striolata (Licht.), *Hume, Rough Draft N. & E.* no. 716 bis; *id. Cat.* no. 720 bis.

The Striolated Bunting is a permanent resident of, and breeds

* *Emberiza buchanani*, Blyth, has not yet been found breeding within strict Indian limits; but Lieut. H. E. Barnes makes the following note regarding its habits in Afghanistan:—"Is very common, appearing in the plains about March; but they retire to the hills in May, when I believe they breed, although I have been unable to verify the fact. But the testes of the males and ovaries of the females are much enlarged at this season. I found an empty nest at the foot of a stunted bush, which I believe to belong to this species.

"This was on the Khojak."

† Of the nearly allied *E. lutrola*, Sparrm., Mr. F. R. Blewitt records having seen a pair in the neighbourhood of Jhansi on the 25th August, 1866. These, however, may very probably have only just arrived. This Bunting certainly breeds in Afghanistan. Major Wardlaw Ramsay says:—"I cannot find any account of the nidification of this Bunting, which breeds so plentifully in the Hariab valley. The first nest found was on the 19th June, and I was somewhat surprised that neither nest nor eggs were at all like those of other Buntings. The nest in question was built in a small bush about 2½ feet from the ground, it was cup-shaped, and composed of dried grass, stalks of plants, shreds of juniper-bark, and lined with a few goat's-hairs. It contained four eggs, of a pale bluish-white colour, finely spotted with purplish stone-colour, the spots becoming larger at the thicker end. The eggs not having arrived from India, I cannot give their exact dimensions."

And Dr. Scully, years ago, recorded the following note on the breeding of *E. lutrola* in Turkestan:—"At least half-a-dozen nests of this species were seen in May and June. The nest is usually placed either in small bushes about a couple of feet above the ground, or touching the ground at the edges of corn-fields and sheltered over by a small shrub. The nest is round, from 4·5 to 5·5 inches in diameter, the side-wall about 1 inch thick, the bottom 1·5. Externally it is made of coarse fibres, leaves, and twigs loosely put together; but the egg-cavity is lined with fine fibres wound round and round, the eggs commonly lying on a bottom-lining of horsehair."

in, all the bare stony hills of Rajpootana and Northern and Western Punjab. It is found, but rarely, in the hills dividing Sindh and Khelat, and very likely breeds there also.

I myself have only taken the eggs near Ajmere, on the slopes of the Aravalli; and I can add nothing to my account of their nidification written on the spot, which has been already published and which I reproduce here:—

“The breeding-season appears to be November and December. The natives say that they also lay early in July, at the commencement of the rains; but as to this I can say nothing. The very first birds that I shot on the 2nd November, the day after I arrived here, proved on dissection to be breeding; and out of the oviduct of a female shot on the 3rd I took a nearly perfect, though colourless, egg. For several days we hunted without success, finding many nests that I believed to belong to this species, and seeing everywhere females about, straws in mouth, but meeting with no eggs. At last, on the 12th November, I myself accidentally stumbled upon two nests. I was walking slowly and (if it must be confessed) footsore and somewhat despondent amongst the loose blocks and rocky shingles of the southern flanks of the Taragurh Hill, when a female suddenly sprang up and darted off from within 2 inches of my foot. I looked down, and there, on the sloping hillside, half-overhung by a moderate-sized block of greyish quartz, was a little nest from which the bird had risen, and which I had been within an ace of stepping on. Close at hand were two or three small tufts of yellow withered grass, but these were several inches distant from the nest. This latter (which, laid on the hillside, was some 3 or 4 inches thick on the valley side and barely three-fourths of an inch towards the hill) was composed at the base and everywhere externally of small thorny acacia-twigs and very coarse roots of grass. This, however, was a mere foundation and casing, on and in which the true nest was constructed of fine grass-stems somewhat loosely put together, the bottom being lined with soft white feathers. The egg-cavity was circular and cup-shaped, about 2·25 in diameter and 1·25 in depth, and contained two tiny yellow-gaped, dusky bluish, fluffy chicks apparently just hatched, and one (as it proved) rotten egg.

“Scarcely twenty yards further, on a slightly sloping slab of stone, partly overhung by a huge block, between two tufts of dry grass springing from the line of junction of the slab and block, I found a second precisely similar nest, containing two fresh eggs, round which both parents fitted closely all the time I was occupied in examining and securing the eggs and nest, exhibiting no apparent signs of fear.

“The three eggs thus obtained were regular, moderately broad ovals, slightly compressed towards one end, but somewhat obtuse at both. The shells were very delicate, and had a slight gloss. The ground-colour differed somewhat in all three: in one it was pale greenish-, in another pale bluish-, and in the third faintly brownish-, white. All were spotted, speckled, and minutely but

not very densely freckled with brown; a sort of reddish olive-brown in two, rather more of umber in the third. Small clouds, blotches, and streaks of the same colour and of a pale purple were intermingled with the finer markings. In two of the eggs the markings were far most numerous towards the large end, where in one they are partially confluent; on the third they are pretty evenly distributed over the whole surface, being, however, rather denser in a broad irregular zone round the middle of the egg.

"These eggs remind one no little of those of *Emberiza elegans* figured by Radde (Reisen im Süden von Ost-Sibirien, Taf. v.), but are not nearly so broad. They are not very unlike the egg of *E. pusilla* as figured by Bree, but they are narrower and more oval.

"On the 16th, near the base of Taragurh Hill, I found another nest, precisely similar to that already described, containing two fresh eggs. These were of the same general type as those already described, but were much more strongly marked. They were richly freckled and mottled with a fine umber-brown on a pale greenish-white ground, the markings being in both most dense at the large end (where there was a conspicuous confluent zone), and almost wanting at the smaller end. The purple spots, well marked on the first three eggs, were entirely wanting in these. As usual, we captured the female bird without the slightest difficulty.

"These five eggs (all I have as yet obtained) have varied from 0.75 to 0.8 in length, and from 0.55 to 0.58 in breadth.

"The nests from which these eggs were taken were all at an elevation of about 2000 feet above the sea-level; but we found others later (empty or containing young ones) from 1500 to 2600 feet. Early on the morning of the 19th November I climbed up the Mudar Shah Range (on the opposite side of the Ajmere Plain to the Taragurh Hill), which is very nearly, if not quite, 2600 feet high. On the highest pinnacle of the long knife-like ridge a tiny square temple is perched, at one season of the year a place much resorted to by pilgrims. Inside the temple the whole upper portion of the domed roof is thickly encrusted with what I may term confluent nests of our Common Swift (*Cypselus affinis*)—a mass of feathers, straw, wool, and the like, cemented together with inspissated saliva. All over the exterior of the temple are little arched recesses sunk about 8 inches in the masonry; and in one of these, about 5 feet above the plinth, one of my people discovered a female *E. striolata* sitting on her nest. Going to the spot, I stood with my eyes within two feet of the bird. She, however, never moved, but sat calmly eyeing me with her bright dark eye. She looked so nice and sleek and cosy that I hesitated to disturb her; but the eggs of this species were almost, if not entirely, unknown in European collections, and I thought it only right to secure all I could; so I emptied a cap-box into my pocket and lined it with some soft rags torn to shreds, and then put my hand out gently to the nest. Away flitted the old bird, disclosing, alas! three fluffy nestlings. I drew back my hand, and that very instant the female

returned and had the chicks under her. They were very young, and the morning air on this lone pinnacle very cold, and hence her extraordinary tameness.

"The nest was built on the flat bottom of the niche, was perfectly circular, with an external diameter at bottom of about $5\frac{1}{2}$ inches and an internal at top of about $2\frac{1}{2}$. The lower portion was composed of fine twigs, the upper portion and the lining of the cavity, so far as the young ones allowed this to be seen, of fine grass-stems. Altogether the nest was about $2\frac{1}{2}$ inches high, and very neat and symmetrical.

"Judging from my present experience, I should say that three was the full number of eggs usually laid."

803. *Melophus melanicterus* (Gm.). *The Crested Black Bunting.*

Melophus melanicterus (Gm.), *Jerd. B. Ind.* ii, p. 381; *Hume, Rough Draft N. & E.* no. 724.

The Crested Black Bunting breeds only sparingly in the plains of India. At Mount Aboo, the loftiest of the Aravallis, it breeds up to an elevation of 4500 feet. Throughout the Himalayas, from Nepal to Murree, it breeds at all elevations from 2000 to 5000 or 6000 feet, and it also nests occasionally in the various Dhoons, Terais, and Bhabhurs that skirt the bases of these mountains. In the Himalayas the breeding-season extends from April to June. In the plains and on Mount Aboo June, July, and August appear to be the months in which it lays.

The nest is placed in holes in banks or walls, on the ground under some overhanging clod or rock, or concealed in some thick tuft of grass, and very exceptionally (I have only seen one such) in a low thick bush within a few inches of the ground. The nests vary a good deal: they are often very slight, loosely put together, shallow saucers, composed entirely of fine grass-roots, without any lining; at other times they are neat compact cups, made with grass or grass and moss, and lined with fine grass, fern- and moss-roots, vegetable fibres, or even horsehair. I have seen loose straggling saucers, 6 inches in diameter, with a cavity barely an inch in depth; and I have by me to this day neat cups, little more than 4 inches in external diameter, and with a deep circular cavity little more than 2 inches across and nearly as deep as wide.

They lay three to four eggs, quite as commonly the latter as the former number; but I have never seen or heard of more being found.

Writing from Jhansi, Mr. F. R. Blewitt tells us that this species "breeds only in July and August. I think my experience is, however, confined to two nests: one was found at the base of a small plum-bush, near to a wall; the other in a hole in a wall. The nests are exact counterparts of each other; on the outside they are made of very coarse grass and roots. The egg-cavity, cup-shaped, has

first an intermediate coat of fine khus, over which, again, is a complete lining of horsehair. The outer diameter is about 4·8, inner 2·6, and depth of cavity 1·4. The nests are compact, especially the inner part of the structure, and neatly made.

"I have only seen this bird at Bubeena and Talbehut, and in pairs. On one occasion I saw five or six together on the Talbehut fort wall. Their favourite resort is old buildings and walls, to which the birds confine themselves, seldom going far away from them. The male has a peculiarly soft, melodious note, repeated at intervals.

"The birds feed on the ground at all times of the day, and their food appeared to consist of small grass-seeds.

"Three appears to be the regular number of eggs. They are of a dull whitish grey, with a sprinkling of light-brown spots."

Dr. G. King furnishes the following account of its nidification on Mount Aboo:—"It breeds here, I should say, in the rains. Two nests observed by me were found (1) 18th July and (2) 1st August.

"The first was situated in a niche in the face of a large stone on the banks of a rocky stream near the Gaomukh, Aboo, at an elevation of about 4500 feet. The niche was concealed by a tuft of grass. The height of the nest above ground was 3 feet. The second nest, found on the 1st August, was situated in a dense patch of wild balsams which cover a smooth slope near a very rocky place behind and above Major Impey's house. Elevation about 4200 feet. The nest was capitally hidden, quite on the ground, and wedged in between the stems of some wild balsams.

"Both nests were precisely similar in shape, subhemispherical, slightly flattened and enlarged below; the egg-cavity deep. The nests, in texture, were rather loose; but the egg-cavity closely and compactly lined. The material consisted entirely of one kind of fine dry grass. The side-walls of one nest were about 0·75 thick, the bottom 1·5 thick.

"The egg-cavity was 1·75 deep and 2 inches wide.

"The first nest contained three eggs, which were taken, preserved, and sent to you. No. 2 contained three young, evidently just hatched. On returning to look at the nest on the 3rd August, I found the young gone and the nest pulled to pieces.

"During the months from April to the middle of August I hardly ever observed this bird in any other than rocky places. It was then very common at Aboo.

"On revisiting Aboo (22nd September to 5th October) I found this species in moult, not nearly so common as it was in the hot weather and rains, and not so much confined to rocks.

"It is a vivacious, rather bold little bird, with a pretty little simple note. I think it must often build in deep chinks in the rocks, as, though I searched repeatedly for its nest, I found only two; my shikaree found a third."

Writing from Mount Aboo, Colonel Butler says:—"The Crested Black Bunting is very common at Mount Aboo. It remains on the

hill the whole of the year, and breeds in June and July. A nest which I found on the 22nd June was placed on the ground on the side of a sloping bank by the road-side. It was composed externally of coarse dry grass and stalks, and internally of horsehair and thin fibres of cocoanut.

"I found another nest last year, on the 20th July, with three fresh eggs in it. It was situated in a small hollow, behind a tuft of short grass, on a sloping bank by the side of a road. I have seen several nests in similar situations since I have been at Mount Aboo."

Mr. H. Wenden writes from the Bombay District :—"This species is breeding freely from about 400 to 1800 feet above the sea.

"I have observed at least a dozen pairs at different points along the Bhoze Ghât incline, i. e. between Kurjut and Lonauli, but have only found five nests.

"One on 3rd July, with three young.

"Others on 9th, 12th, 20th July, and 1st August, each with three eggs.

"All of them in clefts or on ledges of rock within 5 to 10 feet from and from 2 to 15 feet above the rails. One nest was quite exposed to view, but the others were concealed behind grass or maidenhair ferns.

"I have nothing to add to the descriptions of nests given in 'Rough Draft of Nests and Eggs,' unless I note that I have observed none of the 'shallow-saucer' type.

"Two clutches of eggs have the 'pale greenish' ground with purple markings, and one clutch has the 'pale pinky brown' ground and reddish-brown markings.

"The bird lays one egg daily. Both birds assist in building; and while the hen is sitting the cock remains very near the nest and sounds his pretty note frequently.

"I was unfortunate in losing one lot of three eggs. Some animal destroyed them.

"When the 'Rough Draft of Nests and Eggs' was issued, you do not seem to have had record of this species breeding so far south."

From Murree Colonel C. H. T. Marshall tells us that this species "breeds here in June in banks; nest made of grass. Eggs white, thickly mottled with brown."

Captain Hutton remarks :—"On the 6th June I took a nest of this bird from the Dhoon, where it builds on the ground, placing the nest on banks and hedgerows, or beneath the ledge of some bold rock at the side of a ravine. It is chiefly composed of moss loosely put together, with a few fragments of dead leaves without any interweaving, and is lined with very fine roots and black fibres of ferns resembling horsehair. On the 14th of the same month I procured another, similarly constructed. The one contained four and the other three eggs, of a dull stone-grey colour, tinged and spotted with dull purplish brown, and chiefly so at the larger end."

In Kumaon Mr. Brooks found this species laying in the middle of May. He says:—"This bird is common in the open country. The nest is placed in the broken terrace-walls, at the foot of a small bush or tuft of grass. I found one in a small bank about 3 feet high. The nest was placed about 2 feet from the ground, at the roots of a scrubby bush. It was composed of roots, fibres, and grass, and lined with hair. There were four eggs; another nest had three only. The ground-colour was a dull white, with a shade of green, thickly speckled and spotted with reddish brown and purplish grey. The egg is not lined like a Bunting's. I shot the old birds in each instance. The song of the male is a monotonous one of two or three notes only, constantly repeated. The dark-chestnut plumage is not assumed till the second year, and young males breed in their first plumage, which exactly resembles that of the female."

Mr. Hodgson has the following note on the nidification of the Crested Black Bunting:—

"April 15th, Jaha Powah.—Wild uplands of level and partial cultivation. Found a nest in a cultivated field, laid amongst clods like a Lark's nest; is small and shallow, but still of decided shape and firm make, composed of hard thin grass, fibres, and hairs; circular, the cavity 2·5 in diameter and 0·6 deep. Three eggs, bluish ground like milk and water, spotted with dark reddish brown, chiefly at the large end."

The notes add that this species generally make their nests on the ground under the shelter of some clod or tuft of grass. The bird scratches a small depression, and then twists together a small, flat, circular nest of roots and grass.

From Sikhim Mr. Gammie remarks:—"With us the Crested Black-and-Chestnut Bunting breeds in May; it breeds at low elevations from 2000 to 4000 feet; it chooses open and cleared land, and builds its nest on the ground, often under the shelter of fallen trunks of trees or in banks by the sides of roads. The nest is cup-shaped but shallow as a rule, composed of dry grass and lined with a few root-fibres. One I measured had an external diameter of 4 inches and was 2 inches high. The cavity was 2½ inches across by a little over an inch in depth. They lay four to five eggs; at any rate I have never found more."

The eggs of this species vary a good deal in shape, but typically are rather broad ovals somewhat obtuse at the small end; specimens, however, often occur very pointed at this end. The ground-colour is a pale greenish white in some, and pinkish or brownish white in others; and they are thickly speckled and spotted, and in some more or less freckled and mottled, with red, purple, and reddish or purplish brown, the markings of any one egg being usually unicolorous. They are always most dense at the large end, where in the majority of eggs they form a more or less conspicuous but ill-defined and irregularly mottled cap; they have little or no gloss. The markings entirely want the bold jagged line character so characteristic of the eggs of many Buntings. In

some eggs the markings are so closely set as to leave scarcely any of the ground-colour visible, and to give the whole egg a reddish-brown or dingy brown mottled appearance, while in a few the small end of the egg is almost entirely devoid of markings.

In length these eggs vary from 0·68 to 0·86, and in breadth from 0·6 to 0·76; but the average of twenty-two eggs is 0·79 by 0·63 nearly.

Family HIRUNDINIDÆ.

804. *Chelidon urbica* (Linn.). *The Martin*.

Chelidon urbica (Linn.), *Jerd. B. Ind.* i, p. 106; *Hume, Cat.* no. 92.

Major M. F. Coussmaker writes from Bangalore regarding this Martin:—"I took the nest of this bird on May 1, in the Shemogah Districts, Mysore. The spot selected by this colony was a large overhanging rock in the bed of the River Tunga, about three miles from Shemogah; they appear to have bred in the same place for many years, as the under surface of the rock was covered with old nests. The nests I got were so broken that I could take no reliable measurements, but I shall endeavour to get some more specimens next year. The eggs were mostly hard-set, and the number varied from two to four in each nest. They were pinky white before being blown, and measured 7×5 .

"I believe that this species has not been found breeding in India before. Had I known this at the time I would have made greater exertions to get a perfect nest, but the rock is very difficult to get at owing to its shape and position."

The eggs are moderately broad ovals, a good deal pointed and compressed towards the small end; in some cases decidedly pyriform. The shell is fine and compact, but with no perceptible gloss, and of course pure white, without any markings. Two eggs measured 0·75 in length by 0·53 and 0·55 in breadth. •

805. *Chelidon kashmirensis*, Gould. *The Kashmir Martin*.

Chelidon kashmirensis, Gould, *Jerd. B. Ind.* i, p. 107; *Hume, Rough Draft N. & E.* no. 93.

This Martin breeds only in the interior of the Himalayas. It lays, as far as I know, only in April and May, but is said to have a second brood during the rains. Long ago Sir E. C. Buck wrote to me that "there is a large colony of these birds about $1\frac{1}{2}$ to 2 miles from the Muttyana Dak Bungalow on the old road to Narkunda; their nests cover the roof of hollows in the rock about 15 to 20 feet from the ground. Nest of mud, shallow, cup-shaped, with

largish aperture, very close, one above the other in many instances. Young birds appeared fledged in June when I passed. Birds frequented breeding-places at dusk in great numbers. The hollows are almost overhanging the old road."

809. *Cotile sinensis* (J. E. Gray). *The Indian Sand-Martin.*

Cotile sinensis (Gray), *Jerd. B. Ind.* i, p. 164; *Hume, Rough Draft N. & E.* no. 89.

The Indian Sand-Martin breeds in holes in sandy banks of rivers from November to February in some parts of the country, and during April and May in others, and again at both periods in others.

Mr. Blyth remarks (*Journal As. Soc.* xvi, p. 119):—"I have found both newly-laid eggs and young ready to fly in the beginning of December (at Calcutta), and also at the end of February. The nest-holes vary in depth from $1\frac{1}{2}$ foot to considerably more, according as the banks are more or less hard; and the nest itself is composed of dry grass, with occasionally a few feathers in the lining; the eggs are pure white, like those of *C. riparia*."

Colonel G. F. L. Marshall, writing from Saharanpoor, says that this species "builds in the first half of April in a hole about 4 feet into a bank, lining the end of the hole with grass and a few feathers, and lays five pure white eggs." I myself have taken the eggs in May on the Jhelum, and on the Jumna in the Etawah District in February and April, but I have never found more than four eggs.

Major C. T. Bingham writes:—"At Allahabad and at Delhi I have found nests of this little Sand-Martin in eight months out of the twelve, viz. in January, February, March, April, and May (one nest at Allahabad on the 3rd May, containing two very hard-set eggs and two young ones), and again in October, November, and December. They lay in holes excavated by themselves in the sandy banks of rivers, and nullahs, these being from 1 to 3 feet deep and 2 inches in diameter, ending in a nest-chamber slightly larger than the tunnel, lined with straw or grass-roots, with a layer of soft feathers on which the eggs, ordinarily four or five in number, lie."

From the Sambhur Lake, Mr. B. M. Adam tells us:—"The little Bank-Martin is very common about this. I obtained a nest on the 15th April with two very hard-set eggs. The nest was found in a hole in a bank, and was a compactly-built cup-shaped structure: outer diameter 4 inches; egg-receptacle a little over 2 inches. The nest was made of grass and fibres well rounded together; the outer portion of the nest was of a coarser quality than the lining, but made of the same material; depth of egg-cavity $\frac{3}{4}$ inch.

"In Oudh I took a nest of this bird on the 23rd April. The nest was composed of coarse grass loosely put together, and had a lining of biggish feathers. Its diameter measured $3\frac{1}{2}$ inches."

Dr. Scully says, writing from Nepal:—"The bird is usually found over wet fields and marshy ground, and along the course of streams. It has its holes and breeds in the banks of rivers and in the sides of the alluvial cliffs so common in the valley of Nepal."

The late Captain Cock sent me the following note many years ago:—"I first found this Martin breeding in colonies in high sand-banks at Nowshera during the month of February; the place selected was the bank of the river Cabul, and the nests were often placed so close together that by enlarging one hole I could work laterally to the nest-chambers of other nests, for the nests were from two feet to three feet deep in the bank. The nest-chamber was always lined with dry grass, stalks, and a few feathers, and the eggs were usually four in number, pure white. In digging out these eggs and similar ones I use a narrow heavy trowel, and am invariably provided with a looking-glass to flash in the light to see what is in the hole before putting in my hand, as I once touched *Bungurus fasciatus*, and shall not forget it."

Mr. Doig took numerous nests in the E. Narra, Sind, on the 17th February. He himself writes:—"Found numbers of the nests of these little birds in holes in the steep sandy banks along the Narra on the 21st February; of some 30 nests the greatest number of eggs in any one nest was four. The holes were from 2 to 3 feet in the bank, and the nest consisted of grass, lined with a few feathers."

Writing of Rajputana in general, Lieut. H. E. Barnes says:—"The Indian Sand-Martin breeds during February and March."

Colonel Butler remarks:—"The Indian Sand-Martin breeds in the neighbourhood of Deesa in the cold weather. I found seven nests in the bank of a river near Deesa on the 23rd January, 1876, and dug them all out with the following results: No. 1, 1½ feet from entrance of the hole, contained three eggs slightly incubated. No. 2, 2 feet from entrance, contained four fresh eggs. Nos. 3, 4, 5, and 6 contained young ones nearly ready to leave the nest; others, young ones only just hatched. Most of the nests were within 2 feet of the entrance, but one was about 3 feet. The numbers of young birds varied from 3 to 4. The nests, as a rule, were thick pads of dry grass, fibrous roots, &c., thickly lined with good-sized soft feathers, loosely placed at the bottom of the nest. Some nests were thick and solid, others slight, small, and loosely put together. One nest was empty. I found another nest on the 2nd February in the same bank, containing one fresh egg. I took another nest in a river-bank on the 15th March, containing three fresh eggs; it was composed exteriorly of coarse dry rushy grass, and lined with fine dark-coloured fibrous roots, with one large solitary Kullum's feather at the bottom for the eggs to rest upon."

Messrs. Davidson and Wenden tell us that in the Deccan this species is "tolerably common. At Sangola it breeds singly, in

river-banks, in December. On the banks of the Bhima, Davidson got a single nest with three fresh eggs, in March."

Finally Colonel Godwin-Austen notes that this Sand-Martin was "breeding in January at Shirshang in banks of the Lumessary River" in the Khasi hills.

The eggs of this bird, like those of all kindred species, are pure white and devoid of gloss. In shape they are oval, a good deal pointed towards one end; and, so far as size and shape goes, they appear to differ scarcely perceptibly from those of *C. riparia*.

They vary in length from 0.63 to 0.73 inch, and in breadth from 0.45 to 0.53 inch. The average of a large series is 0.68 by 0.48 inch.

I here reproduce a note I wrote years ago regarding the nidification of *C. subsocata*, which I at that time, together with others, considered might be a race or subspecies of *C. sinensis*:—

On the 11th of January, 1867, I came across a colony of Sand-Martins, breeding in the high sandy banks of the Jumna, below Sheregurh, very near in fact to the joint boundary of Etawah and Cawnpoor. I shot two of the birds and got some eggs. I revisited the spot on the 12th March, and again shot a pair of the birds and obtained more eggs.

Later, examining the specimens, I found that they differed from some specimens I had of *C. sinensis*, exactly as pointed out in Sir W. Jardine's letter to Adams, and accepted them as distinct. Further experience has led me to doubt the value of the diagnostic points indicated by Jardine. If distinct, I can say this much of the nidification of the Dusky Sand-Martin:—

They build in communities in sandy banks overhanging rivers. They bore a small hole, about 3 inches in diameter, from 1½ to 3 feet deep into the bank, usually sloping a little upwards, at the end of which they scoop out a sort of chamber, say 6 inches in diameter; there they make a nest of very fine twigs and grass lined with a few soft feathers of the wild goose, brahminy, and such-like water-fowl; they lay from two to three eggs.

The eggs are white and glossless, closely resembling those of *C. sinensis* and *C. riparia*, from which it would be difficult to separate them. Normally, they are a pointed oval, but somewhat cylindrical varieties occur. They vary a good deal in size, as do those of all the allied species.

The eggs that I took of this supposed species varied from 0.64 to 0.74 inch in length, and from 0.48 to 0.53 in breadth, and they averaged 0.68 by 0.5 inch.

810. *Ptyonoprogne rupestris* (Scop.). *The Crag-Martin*.

Ootile rupestris (Scop.), *Jerd. B. Ind.* i, p. 166.*

Ptyonoprogne rupestris (Scop.), *Hume, Rough Draft N. & E.* no. 91.

The Crag-Martin only breeds, so far as I know, amongst pre-

cipitous rocks in the Himalayas at heights of from 7000 to 10,000 feet.

I once found a number breeding on the road from Mussoorie to Simla, not many miles from the new hill station Chukrata. This was at the end of April, and I got both eggs and young birds.

The nests were composed of pellets of clay, and were mostly rather deep saucers plastered in angles of the cliff under projecting ledges. They were warmly lined both with grass and feathers.

I have no eggs now by me. I did not keep eggs in those days, but I noted that they were long oval pinky-white eggs, with numerous specks and tiny blotches of brownish red and purple.

Major Wardlaw Ramsay says, writing of Afghanistan:—"The Crag-Martin was abundant in the valley in June, and apparently nesting in the cliffs near our camp."

811. *Ptyonoprogne concolor* (Sykes). *The Dusky Crag-Martin*.

Cotyle concolor (Sykes), *Jerd. B. Ind.* i, p. 165.

Ptyonoprogne concolor (Sykes), *Hume, Rough Draft N. & E.* no. 90.

The Dusky Crag-Martin breeds at least twice a year. In the plains of India I have mostly found the eggs in January, February, and July; but I have seen them in April, and writing from the Nilghiris Miss Cockburn says:—"These small Crag-Martins build in the months of April and May. One nest was constructed in a small cave which had been dug out of the earth, where some pretty ferns and moss were growing: I admired the Martins' choice of a site for the abode of their young during the few weeks they might require a dwelling-place. The nest was of clay and of a cup-shape, lined with many feathers, and had two white eggs with minute dark spots all over them, but particularly at the thick end."

The nest is solitary, very like the Wire-tailed Swallow's, but deeper and smaller, coming to a well-defined point below; it is lined with feathers.

Mr. F. R. Blewitt says:—"This species breeds in both the cold and hot seasons, though I have obtained most eggs in July and August. It has its nest in holes of walls, on projecting eaves, and sometimes on the ledges of rocks, where convenient shelter is afforded.

"The nest-lining is composed of soft flowering grasses and feathers, the latter forming as it were the inner lining.

"The regular number of eggs appears to be four. Strictly speaking, it does not breed in company, though at Talbehut I have seen two and three pairs together, occupying as many holes in the old fort wall, near to each other. Dr. Jerdon justly remarks of this Martin that it is scattered sparingly. I have found it only in the vicinity of old forts and mosques, and but few in number. When flying, or rather while feeding on the wing, two and three together, they alternately chirrup to each other. It is a *chit, chit, chit*, rapidly uttered in quite a soft melodious tone."

Mr. James Aitken makes the following general remarks on the

breeding of this species :—"The natural habitat of this Swallow is amongst rocks and on the faces of cliffs, and in such situations it may always be found; but it readily avails itself of the windows and porches of houses, even nesting among the two-storied houses in native towns. I have also known it make its nest on the side of a well. The nest is open all round, merely attached to the wall by one side, and is very neatly lined with feathers. The eggs are more round than those of any of our other Swallows, and are minutely speckled with brown, especially about the thick end; the usual number is, I think, three. They are persecuted while building, and occasionally driven away, by the Sparrows; but their open nest not being adapted to the wants of these birds, they do not take possession of it. Though capable, from their length of wing, of great speed, they are no travellers, but may generally be found flying about their chosen cliff or building in a very leisurely manner; the young continue about the spot for some time, but I never saw the old ones feed them upon the wing after the manner of the Wire-tailed Swallows."

Major O. T. Bingham writes, from Allahabad :—"On the 13th October I found a nest with two eggs. A mud cup, stuck against a niche in the ruins of an old temple, $3\frac{1}{2}$ inches in depth outside, 1 in depth inside, lined with a few straws and feathers. Eggs pale pinky white, blotched rather than speckled with tiny marks of grey and purple and sepia."

Colonel Butler writes :—"The Dusky Crag-Martin breeds at Mount Aboo in June and July, on the sides of cliffs and in hollow rocks, sticking the nest to the wall, as do others of the tribe. The nest is usually a half-cup open at the top, similar in composition and appearance to the nest of *Hirundo filifera*."

* On the 26th August, 1876, I found a nest in Deesa similar to the one already described, but built against a wall under the eaves of a building in the European barracks. It contained two nearly fresh eggs. Another nest in Deesa, in a similar situation, containing three fresh eggs, on the 24th September, 1875. Another nest on a beam in the verandah of the regimental school, Deesa, 5th October, 1876, containing three fresh eggs."

And subsequently he wrote from Belgaum :—"Belgaum, 13th July, 1879, three fresh eggs; 11th August, three fresh eggs; 15th August, two fresh eggs; 29th August, three fresh eggs; 21st February, 1880, three fresh eggs; 15th March, three fresh eggs."

My friend Mr. Benjamin Aitken favours me with the following note :—"These birds may be seen wherever there is a range of cliffs or a row of dark walls, provided the place is not much frequented by men; and they always choose the shady side, as far as I have observed, to sail up and down. Their old nests are very numerous on the rocks that line the railway-cutting through the Bhore Ghât, and also on the cliffs at Pooqundhar, the sanitarium 18 m'les south of Poona. These nests are placed at from 5 to 12 feet from the ground. I satisfied myself that the Martins were breeding on the top of the Bhore Ghât at the end of May 1871;

and on the 9th of June I observed a pair at their nest at the bottom of the Ghât.

"At Poona, on the 1st March, 1871, I saw a nest under a ledge of stone in a well. The old bird was sitting, and though repeatedly frightened off the nest only made two or three circles round the inside of the well, and returned to the nest.

"The nest was then given up as inaccessible, from distance and other causes; but on the 20th of the following August my brother went down to the same nest by means of a rope and found two eggs, on which the bird was sitting. He described the nest as extremely fragile; it crumbled to pieces on the least touch.

"In June of the same year my brother, Mr. E. Aitken, saw a nest, in which the parent bird was sitting, under the porch of the Club at Poona. Of this he has perhaps informed you himself."

Messrs. Davidson and Wenden remark:—"In the Sholapoor districts it breeds in abundance in the rains and in February. At Egutpoora it was breeding in the verandah of the Engineers' bungalow in the middle of March and first week in August. At Lanoli on 20th March."

Mr. G. Vidal, relating his experiences in the South Konkan, says:—"Common on the coast and for a few miles inland. I have found nests on the cliffs in February, March, and April, and under the eaves of a bungalow in August."

Referring to Rajputana in general, Lieut. H. E. Barnes tells us that "the Dusky Crag-Martin breeds during March and April, and again in July and August. The nest, composed of pellets of mud, well lined with feathers, is deep saucer-shaped, and is generally affixed to the side of a house under shelter of the eaves."

Mr. R. Thompson writes to me that in the Central Provinces the majority, he thinks, breed in March and April, but certainly in Jhansee and Saugor January and July are the months.

The eggs of this species are intermediate between those of *H. fluvicola* and *H. smithii* so far as the character, extent, and intensity of markings go. The ground-colour is white, and they are all more or less thickly speckled, spotted, and at times, though rarely, blotched with different shades of yellowish and reddish brown. Unlike those of *H. fluvicola*, which are as often pure white as not, these eggs are always pretty thickly marked; but these markings, though better defined and darker than those of *H. fluvicola*, are neither so bold nor so bright as in *H. smithii*. As in both these species, the markings are always most dense towards the broad end, where a more or less ill-defined zone or irregular and partial cap is not uncommon. In length they vary from 0.68 to 0.75 inch, and in breadth from 0.5 to 0.56 inch; the average of a large number of measurements is 0.72 by 0.52 inch*.

* Colonel Butler has communicated to me the following note on the breeding of *P. obsoleta* (Osb.). This bird is not yet known to breed in India:—"I had two eggs sent me this year of a Martin, which I fancy must belong to the present species, although I cannot at present vouch for their identity.

"The nest, which was built of mud with a lining of feathers, and of the usual

813. *Hirundo rustica*, Linn. *The Swallow.*

Hirundo rustica, Linn., *Jerd. B. Ind.* i, p. 157; *Hume, Rough Draft N. & E.* no. 82.

A few Swallows breed during April and May along the whole line of the Himalayas from Cabool to Assam, at heights of from 4000 to 7000 feet. Rarely more than one or two pairs are found, as far as my experience goes, breeding in the same immediate neighbourhood anywhere to the eastward of Cashmere; and, indeed, eastwards of this happy valley it is only here and there that they are met with. I myself have only seen them breeding near Dhurumsalla, at two or three bungalows between Sooltanpoor in Kooloo and Simla, and at Simla itself. Captain Cock first pointed out to me that they breed near Dhurumsalla, where he procured their eggs. From Murree I have received a nest, eggs, and both parents; from Almora, a single egg. Mr. Masson tells me he once noticed a pair building near Darjeeling; and Colonel Godwin-Austen writes that he found this species breeding at Asaloo in April, in the high roofs of the Naga houses. The specimens shot were small, only 12 inches in extent, and may have been *H. gutturalis*. Jerdon mentions this bird as arriving early in July in Upper Burmah; they thus "probably breed along the whole line of high hills from the Burreil and Patkoi Ranges into North Burmah, &c."

In Cashmere they breed more numerously, from all I can learn, than in any other part of the Himalayas.

In Candahar, as Captain Hutton tells us, they breed abundantly.

On the whole, it would appear that while a comparatively small number breed here and there everywhere along the southern faces of the Himalayas, the great majority of the vast numbers that during the cold season throng the neighbourhoods of our jheels and

half-cup shape, was fixed to one of the rafters which support the roof of the verandah of one of the telegraph-buildings at Jask, on the Mekran coast; and in the same verandah were several nests of *Hirundo rustica*. The eggs were white, sparingly sprinkled with small dusky specks, most numerous towards the large end; and the man who took them informed me that one or two pairs of this bird breed there every year, but that they leave directly afterwards. No date arrived with the eggs, but I believe they were taken in March. As I said before, I cannot be sure of the species at present, as unfortunately the skins of the bird that were secured at the time the eggs were taken were destroyed by rats, and consequently never reached me; however, from the account of the bird, which was described to me as 'a pale, dusky-coloured Martin,' and from the man's recognising the bird at once when I described *P. obsoleta* to him, and from the fact of no other pale-coloured Martin (*C. riparia*, which breeds in sand-banks, but not along that coast, being of course excepted) being known along that coast, and that being common in the cold weather, I have little doubt in my own mind that it belongs to the present species; but I hope next year to get skins of the old birds with the eggs, and then the matter will be settled."

The eggs are slightly elongated ovals, a little compressed towards one end; the shell is extremely fine and delicate, but has scarcely any appreciable gloss. The shell is nearly pure white when blown, and is thickly speckled and spotted, most thickly about the broad end, with a sort of sepia-brown, quite devoid of the reddish tinge that is usually observable in the eggs of this family.

ponds seek Cashmere and other more westerly localities to rear their young in.

The nests that I have seen resembled much those of the Wire-tailed Swallow, but were deeper, and had the pellets of which they were composed larger and a good deal mingled with grass &c. The nest sent me from Murree is a very perfect, rather deep, half-saucer; two that I found containing young ones, fixed in corners of verandahs, were mere quarters of very wide and shallow dishes; another, in a tiny niche in a beam, was a mere mud screen, shutting in the lower half of the niche, with a few mud pellets inside, apparently to round off the corners. All consisted exteriorly of pellets composed of mud, more or less mingled with dry fir-needles, straw, and the like—a coarser and far less tidy structure than that of the Wire-tailed Swallow. Interiorly the lining appeared to be chiefly soft feathers; but there was a little fine grass, and in one some grey, very soft fur, which I could not make out.

There were four eggs, slightly incubated, in the Murree nest; but I believe they sometimes lay six.

Dr. Scully writes from Nepal:—"This Swallow breeds freely about the valley in April and May; young birds, just able to fly, are often seen about the beginning of June."

From Sikhim, Mr. Gammie writes:—"The Common Swallow arrives in this district in the beginning of February, and remains till the end of October. They commence building about the end of March, and place their nests in coolie-sheds, stables, outhouses, or open verandahs. The nest is the usual mud structure, thickly lined with soft feathers. As the soil there is not very adhesive, it is mixed with a good deal of grass. In the stable at Rungbee, six or eight pairs used to breed regularly; and the syces, who took an interest in them, were in the way of fixing up small boards here and there, at angles with the roof, on which the Swallows readily built. When undisturbed they get very tame, and I have seen a pair coolly feeding their young on the nest when the heads of four Europeans were within a foot of it. After ministering to the wants of their family, they would perch within a yard of the spectators, and give them a pleasant little song. They breed at least twice in the season, and, I think, occasionally three times. On the 29th April I took a nest containing five hard-set eggs out of a kutcha bungalow, and on visiting the same place on the 28th June following found that the same pair had, in the interim, built a rough nest and reared a brood, which had flown about four days before, and the parents were busy repairing the nest for a third batch of eggs. The usual number of eggs is four or five."

Lieut. H. E. Barnes, writing from Chaman, in Afghanistan, remarks:—"The Swallow is not uncommon; still they do not occur in such numbers as they do in Kandahar, where almost every outhouse contains nests. They breed in May. I found two nests affixed to the roof of a 'Landy,' used as a native hospital. One contained three young birds, and the other three eggs, spotted not unlike those of *Hirundo filifera*; one egg was pure white. They measure 0.72 by 0.5."

The eggs of this species vary much in size and a good deal in shape. Typically they are elongated ovals, a good deal compressed towards the smaller end. The cubic contents of some eggs must be nearly double those of others. The shell is very fine and compact, and has, in some eggs, a slight gloss. The ground-colour varies from pure white to a pale salmon-pink, but in the majority it is white. Typically the eggs are pretty thickly spotted and speckled with brownish red and inky purple, the markings being always most numerous, and at times very dense, towards the large end, where they occasionally form an irregular mottled zone. Occasionally the brownish red is replaced by a slightly reddish olive-brown. In some eggs the markings want the speckly-spotty character of the typical egg, and are merely pale inky-purple and brownish-red clouds. In some, again, the markings are, as a whole, much more minute, and the whole surface of the egg is finely freckled and mottled with pale brownish red.

In size the eggs vary from 0·7 to 0·84 inch in length, and from 0·5 to 0·55 inch in breadth; but the average of seventeen eggs was 0·76 by 0·53 inch*.

817. *Hirundo javanica*, Sparrm. *The Nilghiri House-Swallow.*

Hirundo domicola, *Jerd. B. Ind.* i, p. 158.

Hypurolepis domicola (*Jerd.*), *Hume, Rough Draft N. & E.* no. 83.

Mr. Davison remarks:—"The Nilghiri House-Swallow breeds on the western side of these hills from February to April, rearing (from what I have observed) two broods in immediate succession. The nest is composed of pellets of mud, thickly lined with feathers, open at the top, with the saucer-like depression rather deep; it is usually placed in some building, cave, or against some well-sheltered rock. The eggs, usually three in number, are white, spotted with brown and reddish brown, with a few larger markings of a purplish colour. Occasionally four eggs are laid; but when this is the case I have found that invariably only three hatch.

"About a week after the first brood have flown the old birds begin to remove the topmost feathers of the nest, replacing them by fresh ones. Three eggs are then again laid, and a second brood reared. After this brood have flown, the old birds still continue

* Mr. J. Darling, Jun., records the following note regarding the nidification of *Hirundo badia* (Cass.), which is found in the Malay Peninsula, and may possibly extend to Tenasserim:—"The first bird of this species I shot in Koo-soom was one of a flock that appeared from the east and flew straight away westwards. I afterwards found them in considerable numbers in a large limestone cave, in which they were breeding later on.

"Again, in Poongah, I saw numbers flying about the limestone hills that surround the town. Their habits and voice are almost similar to that of *H. javanica*. The nest is built of pellets of mud stuck to the under surface of some rock in the shape of a half-goglet with a very long neck, and is lined with coarse grass-roots and feathers."

to occupy the nest at night, or, more correctly, to occupy the edge of the nest, for they do not get into it, but merely sit close together on its edge. The same nest is occupied the following year, the upper feathers being only removed and replaced by fresh ones. Should the nest have been destroyed a fresh one is built on the same site.

"The bird does not begin to sit till the full complement of eggs are laid, and both birds take part in the task of incubation."

Mr. Wait, writing from Conoor, to the eastward of Ootacamund, remarks that they "breed from April to June, building under eaves, bridges, open sheds, &c., and generally against the sides of the rafters. The nest, composed of mud pellets worked together and lined with soft feathers, is somewhat irregular in its external shape, and has a rather shallow cup-like egg-cavity some $2\frac{1}{2}$ inches in diameter; they lay from two to five eggs, very round ovals, white, spotted with reddish brown."

Miss M. Cockburn, writing from Kotagherry, remarks:—"They are fond of returning to the same places in which they build every year, and appear to prefer erecting their little nests in verandahs and eaves of outhouses. Many years ago I remember watching for some days a battle between a cock Sparrow and a pair of House-Swallows. The latter had finished their nest in our verandah, when the Sparrow discovered it, and never left it except for the purpose of satisfying his appetite. The poor Swallows saw they could do nothing, so they disappeared and told their friends the sad tale in Swallow language; and as 'in the multitude of councillors there is wisdom,' some time after, to our surprise, we saw a great number of House-Swallows, each with a wee lump of clay in its bill. They flew up to the nest, and succeeded in building up the sides, the Sparrow inside doing his utmost to stop their work; but they, being accomplished artisans in their own masonry, did not take a second to fix each piece of clay. It became a most exciting scene, and we fully expected the Sparrow would have been imprisoned for life; but no, he was much too crafty to allow that. With one effort he burst through the very small hole which was unclosed, and escaped, being attacked by all the Swallows at the same instant. This conflict ended by the rightful owners having possession of their nest. They build here in the month of April, and lay two white eggs with dark specks and spots."

Dr. Jerdon says:—"I found it breeding chiefly in deserted bungalows and outhouses at Ootacamund, also at the Government wooden bungalows at the Avalanche. The nest small, open at the top, and profusely lined with feathers; the eggs were two or three, white, spotted with reddish brown. It also breeds in houses in Nawara Ellia, in Ceylon."

Mr. Rhodes W. Morgan, writing from South India, says:—"It breeds in the Neilgherries in the roofs of houses and verandahs, also on large rocks and cliffs. In shape the nest resembles a pocket or the half of a teacup. It is formed of small clay pellets, agglutinated together with the saliva of the bird, and is very

firmly cemented to the face of the rock. The lining consists of feathers. The eggs are generally two in number, minutely speckled with claret-coloured spots on a whitish ground, the spots being gathered together in a zone at the larger end. Average length 0·77 inch, breadth 0·5.”

In Ceylon, according to Colonel Legge, this Swallow breeds in April, May, and June.

Mr. W. Theobald makes the following remarks on the breeding of this bird in Tenasserim:—“Lays in the second week of April. Eggs three in number, long, ovato-pyriform; size 0·77 by 0·52 inch; colour white, spotted and ringed with umber. Nest a saucer of mud; inner part coarse roots profusely lined with feathers and vegetable down, attached to the under part of snags projecting some 4 feet above the water.”

The eggs of this species closely resemble those of *H. rustica*, but are decidedly smaller, and are, I think, somewhat less glossy. They are moderately broad ovals, slightly compressed towards one end, have a pinky-white ground, and are very finely speckled and spotted, thinly at the small end, more densely at large end, where there is a tendency to form a zone, with different shades of dull purple and brownish red. In some the markings are comparatively large and coarse, in others excessively minute, and the intensity of the colour of the markings varies much in different specimens.

In length the eggs vary from 0·64 to 0·77 inch, and in breadth from 0·48 to 0·57 inch; but the average size is about 0·7 by 0·5 inch.

818. *Hirundo smithii*, Leach. *The Wire-tailed Swallow.*

Hirundo filifera, Steph., *Jerd. B. Ind.* i, p 159.

Uromitus filifera (Steph.), *Hume, Rough Draft N. & E.* no. 84.

In the plains of India the Wire-tailed Swallow breeds chiefly in February and March, and again in July, August, and September; but I have seen eggs as early as January and as late as November. In the lower ranges of the Himalayas, where it breeds up to an elevation of from 4000 to 5000 feet, I have taken the nests both in April and May, and have had eggs sent me in June.

They breed almost exclusively in the immediate neighbourhood of water, under the cornices of bridges, under culverts beneath which some little pool remains, under overhanging shelves of rock or kunkar, projecting from the faces of stony or earthy river-cliffs, and in cells of buildings overlooking the water.

The nest is composed exteriorly of mud, and is usually lined with feathers; in shape, for the most part, about two thirds of a deepish cup. I have a note of two nests which I took at Etawah at a canal-bridge, March 8th, 1867; one contained three, the other two eggs. Those of the one nest were ready to hatch off; those of the other were quite fresh. The shell of the nest was made of pellets of clay. In shape the first was half of a wide cone, blocked

up against the voussoir faces just below an overhanging cornice. Internally it was carefully lined with a few fine roots of grass and many soft feathers, chiefly those of doves and parrots, so as to leave a neat hemispherical cavity for the eggs. The second was a deep cup, plastered against the face of the bridge, a little way below a square projection, and had absolutely no lining of feathers, only a few grass-roots.

A beautiful nest taken by Mr. Adam in the Etmadoodowla Gardens at Agra in the third week in August was a broad shallow half-saucer of pellets of clay, about $5\frac{1}{2}$ inches broad and about 3 inches from front to back, plastered against one of the walls of the small cells facing the river and near the roof. Several other birds of the same species were breeding in the same cell. The bottom of the nest was about $\frac{3}{4}$ inch and the sides about $\frac{1}{2}$ inch thick. The cavity was lined with fine grass-roots and a very few feathers. It contained three fresh eggs.

Mr. Adam remarks:—"On the 15th July, at Sambhur, I observed this species building in an old rest-house.

"The nest was half-finished, and was placed in a very exposed place under the cornice, about 10 feet from the ground. Both birds were bringing mud from an open well about 200 yards off; but the male seemed very inactive, and appeared to be shy of approaching the nest while I stood about 8 yards off with my binoculars, watching the building-operations.

"The mud was taken from the water's edge, each bird taking from eight to ten pecks at the mud to fill its bill, and sometimes with the mud a piece of fine grass was taken. When the birds reached the nest, the mud was discharged along the edge by shaking the head and body, much like the shaking which takes place when a pigeon is feeding its young. The grass or fibre was carefully worked along the edge of the nest, and great care seemed to be taken by both birds to make the portion attached to the wall very secure.

"On the 18th July I once took a nest with four eggs from an old well. The eggs were pinkish white with rust-coloured spots and blotches. On several occasions during August I have found the nest of this bird about old buildings along the Jumna near Agra. The nests generally contained three eggs."

Three, I think, is the usual number of eggs; but I have found only two, hard-set; and Mr. W. Blewitt, who took several nests during July and August, all built under canal- and drain-bridges in the neighbourhood of Hansie, found four eggs in two of the nests.

Where there is plenty of water, from three to seven nests will often be found quite near to each other; while, where there is little water, they are usually quite solitary.

Dr. Jerdon remarks that "it breeds in old buildings, on walls, in stone bowries or wells, and very commonly under bridges and in rocks overhanging water, making a small nest, open at the top, and laying two or three eggs, which are white sparingly spotted with

rusty red. I always found the nest single, and we seldom see more than five or six couples in one place."

Major O. T. Bingham says:—"I have found many nests of this beautiful Swallow under the bridges on both the eastern and western Jumna canals at Delhi. They are half-saucers of mud lined with straw and a few soft feathers. On the 27th May eleven nests that I took contained three eggs each and more than half of them hard-set, so that I should say the bird breeds about Delhi in April and May."

Mr. James Aitken, writing of this Swallow, says:—"This species supplies in Berar the place of *H. rustica*, which it so strongly resembles in its habits. It seems to be even fonder of water, indeed it rarely leaves it, skimming over the surface with a speed matching that of the Swift, its metallic colours flashing in the sun. It is a permanent resident, and breeds from February till June. The nest is a mere shallow saucer built under a rock or wall, sometimes even an earthy bank at the waterside, and it exhibits in the construction all the forethought and patience of its English relative. The first nest I watched took four weeks to complete, a narrow layer of mud being added cautiously each day and left to dry. When this part of the business was complete, a lining of fine grass was added, then one of feathers, and on this were laid three long-shaped eggs, of a white colour, well spotted with dark reddish brown. I confess to having been guilty of the cruelty of taking two of these for my collection, but the faithful little bird continued still to sit, and I had afterwards the satisfaction of seeing the remaining egg hatched and the young one fledged. Long after they are able to fly the young are fed in the air by the old birds exactly after the manner of the English Swallow, parents and young circling round and round and then, with a complacent twitter, clinging together for an instant, during which the mouthful of insects is transferred from one to the other."

Mr. Benjamin Aitken tells us that he has "observed the nidification of the Wire-tailed Swallow only on the river at Akola."

"One pair had a nest on the 23rd December, 1869, but I did not examine it. On the 7th of January (1870) another pair were building a nest.

"Three eggs were taken from a nest in the beginning of February 1870. The birds at once began a new nest against a rock a few yards off from the first place, and successfully reared three young.

"On the 26th July, 1870, I made a note that the Wire-tailed Swallow had almost disappeared from Akola; they had been common on the river in the dry season."

Colonel Butler says:—"I found a nest of the Wire-tailed Swallow at Deesa on the 10th August, 1875, fastened to the brick-work of a well, but could not ascertain its contents, as I could not induce any of the coolies to go down and take it. I took another nest out of the same well on the 11th August the following year (1876) containing two eggs very slightly incubated. It was a half-cup, built of mud and thickly lined with feathers, and fastened to

the brickwork under an overhanging ledge of stone. I have often found the nest under bridges overhanging the water, and in holes of rocks with a similar aspect."

Writing subsequently from Sind, he further says:—"Hydrabad, Sind, 9th June, 1878. A nest under an archway over a canal, containing two fresh eggs. Another nest in a well on the 12th June, containing three fresh eggs. Two more nests under archways over canals on the 20th idem, each containing three fresh eggs; and any number of other nests later on in the same neighbourhood, and in the E. Narra in similar situations."

Messrs. Davidson and Wenden, writing from the Deccan, remark:—"Common and breeds."

Lieut. H. F. Barnes, writing of Rajputana in general, tells us that "the Wire-tailed Swallow, to my thinking the handsomest of the Hirundines, breeds from the latter part of February to April, and again in August and September."

The eggs are in shape a long narrow oval, a good deal pointed towards one end. In some there is a pyriform tendency, and some are so excessively long and narrow as to recall the eggs of *Cypselus affinis*. In texture they are fine and delicate with, when fresh, a beautiful gloss, which, however, almost disappears as incubation proceeds. The ground-colour is white or pinkish white (when fresh and unblown almost a delicate salmon-pink, owing to the yolk partially showing through), richly speckled, spotted, and blotched with various shades of reddish brown and brownish red. The extent of the markings varies greatly, as well as the intensity of their colouring. Some are spotted pretty uniformly all over; but in the majority the markings are most numerous at the large end. Occasionally they are gathered into a well-marked zone towards this end; and one egg has a nearly complete cap of confluent markings covering the whole of the larger end. These are the most richly-marked Swallow's eggs that I know, and some specimens are excessively handsome.

The eggs vary greatly in dimensions, viz, from 0.65 to 0.8 inch in length, and from 0.5 to 0.57 inch in breadth; but the average struck from a large number of measurements I find to be 0.72 by 0.53 inch.

819. *Hirundo fluviicola*, Jerd. *The Indian Cliff-Swallow*.

Hirundo fluviicola, Jerd., *Jerd. B. Ind.* i, p. 161.

Lagenoplastes fluviicola (Jerd.), *Hume, Rough Draft N. & E.* no. 87.

The Indian Cliff-Swallow is one of the commonest of our Swallows, in Upper India at any rate. From the Tonse River near Mirzapur to the Sutledge near Ferózpúr it abounds wherever there is water and cliffs or ruined buildings against which it can plaster its huge mud honeycomb-like congeries of nests. In the Doon under the Solanee Aqueduct, in Ajmere, at Ahmedabad, in Guzerat, in Saugor, in the Central Provinces, and twenty other places, I have noticed numerous colonies in and on buildings; and as for

breeding in cliffs, to give one single instance (and I could give fifty), visiting the River Chambal, where the Etawah and Gwalior road crosses it, and following its course downwards to its junction at Bhurrey with the Jumna, one will meet with at least a hundred colonies of this species, all with their clustered nests plastered against the faces of the high clay cliffs which overhang the river.

They breed, according to my experience, from February to April and again in July and August. They build a small, more or less retort-shaped mud nest, in clusters of from 20 to 200, packed as closely as possible, so that a section parallel to the wall or cliff face against which a colony has established itself, and about 4 inches away from the wall, would present an appearance much like that of a honeycomb, though the cells would be less regular. The tubular mouths, from 2 to 5 inches long, all point outwards, but those of the exterior nests of the cluster are generally turned somewhat. The chambers vary a good deal in size, but average about 4 inches in diameter. Their nests are to be found equally in the wildest and most desolate, and again, as at the Kotwalee in Dehra and the city-gate at Ajmere, in the most thronged and frequented localities.

The nests are well lined with feathers, and I remember more than once that, when robbing these nests, numbers of feathers were carried away by the wind, all of which the little Swallows industriously captured in their mouths, but at last, not knowing what to do with them, the men being still at work at the nests, apparently reluctantly let them fly.

Mr. B. Thompson says:—"I found large numbers of this Swallow breeding in the Central Provinces, especially about the fine arched bridges which span the rivers on the Great Northern and Deccan road."

Mr. F. R. Blewitt enquires:—"Does this bird breed twice in the year? I ask the question for the following reason. Though I have occasionally seen this Swallow in other localities, yet only at Talbehut have I found the nest. On the side wall of a Hindoo place of worship facing the main road of the city there are clustered closely together above one hundred of these retort-shaped nests. When I passed there in the latter end of April the birds, a perfect colony of them, were breeding.

"Owing to the strong prejudice of the people, who would not permit the nests to be robbed, I with difficulty secured four eggs. Again, in the same nests, the birds were found breeding in August, and some twenty eggs obtained. Four appears to be the regular number of eggs."

So far as I can judge, *three* is the normal number; I have opened a very large number of nests, and only twice or thrice found more than three eggs."

Mr. James Aitken writes:—"The smallest of our Swallows, and much less familiarly known than the other species, as it lives in colonies, and is strictly confined to certain localities; at Akola there is one of these colonies, which build their nests under a

broken portion of a wall which stretches out into the Moorna. The nests are retort-shaped; a few stand apart, but the majority are attached together, the tubular necks all standing out from the wall, and presenting a very peculiar appearance. With the first heavy showers of the monsoon, the river comes down in a flood and washes the whole place clean. As soon as the rains abate, rebuilding commences, and the bustle in the early morning is prodigious, the birds hurrying from all quarters with their bills full of mud. They are much persecuted by Sparrows, who take possession of the egg-cup of the nest before the neck is added, and a single pair will cause several nests to be deserted before they suit themselves. As soon as the nests are finished the eggs are laid, and when hatched the birds simply throw the egg-shells into the water instead of carrying them to a distance, as is done by most birds, aware apparently that the stream will carry them away. I have noticed this also in the case of the Weaver-bird. The second brood is in February, during which month they swarm about the nests like bees about a hive, while every now and then splash into the water goes some too fragile neck, breaking even under the light weight of the little owner. These breakages do not, however, interfere in the least with the process of incubation, but appear to be repaired even while the mother bird is sitting. The eggs are two, sometimes three, in number, of a white colour, spotted with faint red; I have seen some, however, pure white. They vary greatly both in colour and size.

"After the young quit the nest, they associate in a large flock, playing about over the surface of the water, and drinking frequently as they fly. The old birds do not by any means confine themselves to the water, but spread freely over the country, and sing much on the wing. Their flight is comparatively feeble."

Mr. Benjamin Aitken, relating his experiences of this Swallow, says:—"You remark that the Indian Cliff-Swallow builds its nests 'in clusters of from 20 to 200.' It may therefore interest you to know that the only group of their nests I have observed consisted of about 600 nests. It was on the river at Akola, Berar, below the bund. There was a pool at the place, so that unless heavy rain had flooded the river the water was, in wet and dry season alike, breast-high. The nests were therefore much more difficult of access than one would have supposed, looking at the almost dry condition of the channel below the bund. The lowest rows of nests were only a foot or so above the surface of the water, but on wading up I could not see into a single nest, and could not reach more than a few with my hand. The nests were placed under the wreck of an old bridge, and were quite inaccessible from above. The birds were occupied about their breeding twice a year, but either they had two broods each time or some of them delayed much longer than others to lay their eggs. At any rate, the period between the time the flock returned to the breeding-place and the time when the old and young birds were scattered over the country was about two months. I regret that I was very

negligent in making exact notes of their nidification; the following are all I have :—

“7th Jan., 1870. Young birds just fledged.

“17th Jan., 1870. Scores more have left the nest.

“22nd June, 1870. The Swallows have come back to their nests in great numbers.

“5th Jan., 1871. Swallows breeding.

“9th Feb., 1871. This morning I waded into the water and examined a number of the nests. I first put my fingers into those with short necks, and found them all empty. I then broke open five nests that had necks 6 inches long. Of these two were empty, but lined with straw, feathers, and rags; two more contained young birds; the fifth had three white eggs. It is worth recording that for some weeks past young birds have been leaving the nest, the old ones feeding them on the wing. The nests are made entirely of pellets of clay, all exactly alike and as large as dry peas. I lately watched about twenty of these Swallows building; they took the mud from the edge of the water about ten yards from the nests, and were in a tremendous bustle. They took several pecks at the mud to make each pellet, and stayed five seconds on the ground each time.

“A colony of these Swallows breed under a bridge over the river at Poona, but it would be impossible to get a sight of the nests without a boat, and the Poona Boat-club never go on that branch of the river.”

Messrs. Davidson and Wenden remark of this Swallow in the Deccan :—“Very common. Breeds in great numbers under the railway-arch over the standing water of Sholapoor tank.”

Colonel Butler says :—“I have eggs of the Cliff-Swallow taken at Sattara in 1875. Some are pure white, the others marked all over with pale yellowish brown.”

Captain E. R. Shopland, I.M., found this Swallow breeding at Ahyab. He says :—I found about ten nests in April under a bridge; some contained young birds, others fresh eggs. The nests were composed of mud and lined with grass, casuarina-leaves, and feathers. The greatest number of eggs in any one nest was four, and they were white speckled with two shades of brown, chiefly round the larger end.”

The eggs of this species vary much in size, shape, and colour. Typically they are a long oval, a good deal pointed towards one end; but some are fairly perfect ovals, while others are pyriform, and here and there a nearly cylindrical variety is observable. They are smaller, as a rule, than those of *H. erythropygia* and more glossy, resembling in these respects those of *H. filifera*. The ground-colour in all is white, a good deal tinged, when fresh and unblown, with pale salmon-colour, due to the partial transparency of the delicate shell. About half are pure and spotless white, the rest are more or less streaked, mottled, speckled, or clouded with pale yellowish, or somewhat reddish brown. The markings are never bold or sharply defined as those of *H. filifera* so commonly

are ; and though the difference may not be very apparent by the description, in practice the two eggs could not well be confounded. As a rule the markings are most numerous towards the large end, where they have a tendency to form an ill-defined mottled cap, and in many eggs they are almost entirely confined to it.

In length the eggs vary from 0·65 to 0·8 inch, and in breadth from 0·48 to 0·58 ; but the average struck from fifty eggs is 0·76 by 0·53 inch.

822. *Hirundo nepalensis*, Hodg. *Hodgson's Striated Swallow.*

Lillia daurica (Linn.), *Hume, Rough Draft N. & E.* no. 85 bis.

This, the larger of our Indian Mosque-Swallows, although visiting during the cold season the plains of India, breeds, so far as I know, exclusively in the Himalayas—I mean, of course, within our limits.

It is very familiar about the houses of most of our hill-stations, but I think constructs its nest by preference under the eaves and in the verandahs of empty houses and staging bungalows, which are seldom in the hills occupied for many successive days in any month. At the same time its nest is often to be seen under projecting ledges of cliffs, and occasionally, where these occur, in ruined buildings.

The breeding-time, according to my experience, is from April to August ; but I have taken a dozen eggs in July to one in any other month. The nests are very similar to those of its plains congener, long and retort-shaped, very neatly built with clay pellets, as a rule very warmly lined first with grass or fibres and fine roots, and then with various-sized feathers, of which there is often quite a large bunch. They average, however, much larger than those of *H. erythropgia*, and one I recently measured had the tubular entrance 13 inches in length and the chamber more than 7 inches in diameter exteriorly.

Mr. Brooks remarks :—"The nest is always a half-retort, fixed to the underside of an overhanging rock or cave, generally with only one entrance ; but a friend of mine, Mr. Horne, gives me an account of one fixed to one of the verandah rafters of a house where the nest has two entrances.

"In the hills about Almora I found the nest several times, sometimes in open exposed places, at other times where the rocks were overgrown with wood. The eggs resemble those I took in the plains. The plains bird does not breed till the hot winds are over, end of June or beginning of July ; but in the hills I found eggs nearly hatched in May. Others at Binsur, Mr. Horne informs me, have only just laid in the middle of July, when I write. The hill-bird breeding in the verandahs of houses, as well as in eaves, accords with the habit of the Chinese bird, which Mr. Swinhoe remarks 'breeds under the roof-tops.'"

Captain Hutton says :—"This is the common Swallow of the

Doon and hills, arriving in the latter locality in March, and building its retort-shaped nest of mud beneath the eaves of houses, against window-frames, at the side of verandah beams, and other suitable situations; the lining is of feathers. Some eggs taken on the 29th of May were hard-set, but other broods were still earlier, as a nest placed against the window of my room had then contained young ones for some days previously. During the heavy mists of the rainy season these nests often fall by their own weight from the quantity of moisture imbibed.

"When far removed from houses, these birds resort to lofty rocks, beneath the ledges of which the nest is placed. Its shape is flattish hemispherical, with some variation, being at times more globose, with a long neck forming the entrance passage, and thus giving the nest a retort shape. When the bird has selected the spot on which it intends to build, it usually deposits a white chalky substance, by way of cement, against the wall or beam as the case may be, as an adhesive foundation for the subsequent wall of mud. Without this precaution the weight of the material would cause it to part from its foundation. This same whitish earth may also be seen in the narrow neck of the nest, more especially at the mouth, where strength is required to resist the constant abrasion that would otherwise ensue from the frequent entrance and exit of the bird. Generally speaking, this chalky cement is applied to any part that may from circumstances appear to require strengthening, as it likewise gives consistency to the mud. Sometimes, if the situation affords sufficient room, the long neck projects in a straight line from the body of the nest, but where the space is confined, or an obstacle interposes, the neck is turned off at an angle, and in such cases there is pretty sure to be a layer of the chalky cement at the point of deviation from the previous direction. When, however, the material is of a sufficient consistency to be adhesive without the cement, none is applied. In the construction of the nest the mud is laid on in small rounded lumps, which gives a rude and knotty appearance to the surface. The lining is abundant and is composed of fine grass and feathers.

"There are frequently two broods from the same nest in the same season, the first in the end of May and beginning of June, the other in July and August. The birds that built against my window reared one brood in June, and, as soon as the young were able to fly, they were escorted by the old birds during the day and were initiated in the art of fly-catching, returning to the nest about sunset or earlier if the rain was heavy. This continued for about ten days, when the young birds disappeared, and the old ones laid again in the same nest towards the end of July."

The late Captain Beavan mentions that he "found a nest which was built in the verandah of the dāk bungalow at Fagoo on the 2nd August, 1866. It was then but just finished, and the female had not yet begun to lay her eggs. The nest is like that of *H. rustica*, made of mud, but has a funnel-shaped entrance, some 4 or 5 inches in length, continued from the top of the nest along the

angle caused by the meeting of the wall and the roof. The female keeps inside the nest, and from the continued twittering which she made when visited by the male, I thought at first that the nest contained young; and it was not until I drove her out that I discovered my mistake."

Writing from Murree, Colonel C. H. T. Marshall remarks:—"This is the House-Swallow of Murree—breeds under all the eaves. Lays pure white eggs in June."

The eggs of this species are similar to those of *H. erythropygia*, except that they are slightly larger. They are long ovals, slightly compressed towards one end, pure white, the shell of exquisite fineness, and somewhat, but not very, glossy.

In length they vary from 0.81 to 0.89 inch, and in breadth from 0.55 to 0.6 inch, but the average is 0.85 to 0.55 inch.

823. *Hirundo erythropygia*, Sykes. *Sykes's Striated Swallow*.

Hirundo daurica, Linn., *Jerd. B. Ind.* i, p. 160 (part.).

Lillia erythropygia (Sykes), *Hume, Rough Draft N. & E.* no. 85.

Sykes's Striated Swallow, which is, as a rule, a permanent resident of the plains, breeds, according to my experience, from April to August.

Typically the nest, which is usually affixed to the under surface of some ledge of rock, or the roof of some cave or building, and which is constructed of fine pellets of mud or clay, consists of a narrow tubular passage, like a white-ant gallery on a large scale, say some 2 inches in diameter, and from 4 to 10 inches in length, terminating in a bulb-like chamber from 4½ to 7 inches in diameter externally. These nests have been aptly described as retort-shaped, and I do not think any lengthy description will convey a clearer idea of the typical shape. They are not always, however, of this shape. Indeed (though I am bound to say I cannot agree with him) Mr. F. R. Blewitt, who has probably taken more of their nests than any one else in India, is disposed to believe that the long retort-shaped nests are commonly built as residences, and the less-developed ones as breeding-places. He says:—"Eccentric to a degree is this Swallow in the selection of a suitable place for its nest. I have obtained it on the ground, at the base of a rock, having for protection just a small overhanging ledge; in a hole in any old wall; affixed to the roof-top of a pukka house; to the under ledge of a high rock; the arch of a culvert or bridge, &c.; but never, though they may occur there, 'in mosques and pagodas,' and 'twenty and thirty together,' as stated in Jerdon. I have always found the nest single. The form and material of the nest depend mainly on the locality chosen for it. Sometimes a simple collection of feathers answers the purpose, at others, as when attached to a roof-top, ledge of rock, &c., it is more or less dome-shaped, the exterior of fine clay, the inside lined with feathers. The opening for egress and ingress is invariably made above the

centre of the nest. Frequently have I seen the 'spherical or oval-shaped mud nest with the long neck or tubular entrance,' described by Jerdon, but only *once* with eggs in it. This peculiar-shaped nest is also constructed at times by *H. flifera*, and from frequent observations I have sometimes fancied that it is intended more for a winter residence than for breeding purposes. I have recently observed many of both species actively employed in the construction of these nests, long after the breeding-season was well over. In the beginning of August I robbed a nest of *H. erythropygia*, found attached to the roof of an outhouse: and in the identical place from whence I had removed the former nest, the same pair of birds have now nearly completed a new nest, 'oval-shaped, with the tubular entrance,' for, as I suppose, a winter retreat. The birds only occupy it at night. The eggs are pure white, and four appears to be the greatest number."

During the breeding-season the old birds fly round about their nest, morning and evening, uttering quite a variety of rather pretty, somewhat musical notes. During the day they remain near, and one of them generally in the nest, or the pair may be seen perched on some stone below the nest, sitting for an hour at a time preening their feathers, the male every now and then singing a few notes. Old quarries, like those near Futtehpore Sikri and Chunar, are favourite breeding-haunts of this species; and so are the old Moslem ruins that abound so in Upper India.

The nest-chamber is lined, sometimes thickly, sometimes thinly, with feathers only, as a rule, but occasionally with a mixture of these and fine grass.

They are not easily driven away once they have made a nest. I have broken into nests twice running, to see if any eggs were laid, and each time the birds have repaired the nest, in which, despite these repeated burglaries, they have finally laid.

Major C. T. Bingham remarks:—"Breeds at Allahabad in March, April, May, and June, and at Delhi. I have found their nests also in September. They build long retort-shaped nests made of pellets of mud, plastering them against the roof of culverts underneath, against the top of caves, in banks of rivers, and in ruins, against the roof of any deserted mosque. Three, I think, is the ordinary number of eggs laid; these are pure white, and rather cylindrical in shape."

Colonel Butler, writing from Aboo, says:—"Very abundant at Aboo, where it breeds during the rains in June and July, fixing its curious retort-shaped nest usually to the roof of a cave, and laying two or three pure white eggs. I am doubtful whether it occurs in the plains during the hot weather, but I am inclined to think it does not. My opinion is that most of them pass the hot weather on the hills, where they abound at that season, and breed in the rains, returning to the plains again about the end of September, soon after which they disappear entirely on the hills, and become very common all over the plains."

And he subsequently added the following note:—"The Red-

rumped Swallow breeds in the neighbourhood of Deesa in June and July. The nest is usually stuck to the roof of caves or holes in rocks, and, like that of other Swallows, is built of mud externally, and lined with dry grass and feathers. It is of a peculiar form, being completely closed up, of an oval shape, terminating at one end with a tubular passage about 7 or 8 inches long, by which the birds enter. During the period of incubation, the female sits very closely, suffering a great noise to be made without flying off the nest. It is not uncommon to find both birds in the nest during the time the hen is sitting. I have taken nests in April at Mount Aboo, but these were exceptionable instances, as they do not as a rule commence building before the middle or end of May. In the plains they often build under bridges, archways, across nullah culverts, &c."

Mr. Benjamin Aitken mentions that "Between the 20th and 31st May, 1871, Jerdon's Red-rumped Swallow was observed to be in possession of nests, in similar places to those of *Cotyle color*, at Khandalla, a hill-station on the top of the Bhore Ghat."

Mr. G. Vidal notes from the South Konkan:—"Common and generally distributed. Breeds in the hot weather on the cliffs and under eaves of houses."

Mr. James Aitken says:—"This is one of those birds which seem highly to appreciate the advantages of civilization, and to think, like Cowper's cat, that men take a great deal of trouble to please them. In Berar they have almost discarded the mosques which gave them their name, and have betaken themselves to the culverts of the roads, which are now being constructed all over the country. Wherever a road is made some of the culverts are sure to be taken possession of, as soon as the rains commence, by pairs of these Swallows, which may be seen darting in at one end and out at the other, or hawking about for flies over the pools of water at the road-side; their flight has, however, nothing of the extreme rapidity of that of the Swifts or Wire-tailed Swallows. During the cold season the young often assemble in large flocks, but these all disperse, or perhaps migrate, as the weather gets warmer, and only a few pairs remain to breed during the monsoon. The nest is of mud, with a prolonged entrance running along the wall, and is lined with coarse grass and feathers. The eggs are long shaped and pure white, without spot of any kind. In the subterraneous situation in which the nest is so often placed, and with the air still further excluded by the long neck, it is a marvel how the young escape suffocation."

Mr. Davison remarks:—"This species breeds on the Nilghiris about the commencement of April. The nest, as usual with Swallows, is composed externally of mud, and thickly lined with feathers; it is shaped like the half of a Florence flask. It is placed generally against the roof of a cave or overhanging rock. The eggs are generally three in number, pure white, and of rather an elongated form. Several nests are often placed close together,

and often some favourite site is apparently the bone of contention between several pairs.

"I once found, a few miles out of Ooty, several nests of this bird placed on the underside of a large overhanging rock, and although the breeding-season had long passed (it was, I think, in the early part of November that I found these nests), I nevertheless climbed up to where the nests were, to see if there were any addled eggs. After examining a few of the nests, I came to one which had the tubular entrance walled up, and the mud perfectly hard and dry. On breaking away a part of the nest I found a dead bird in it, which had come quite to the sealed end of the tubular neck, and had there died; the nest contained three old eggs, of which the contents had partially dried up. I can only account for this bricking, or, I should say, walling up of the entrance to the nest, by supposing that some of the other birds had coveted and failed to obtain this site for their nests. It is only natural to suppose that more than one pair were concerned in the business, as it would have taken at least one bird to keep the bird from leaving its nest, and another to keep its mate away from the nest, and probably another, or several other pairs to close the entrance."

Dr. Jerdon (who, however, did not discriminate this and the preceding species) states that "a few couples, at all events, breed in the south of India; for I have seen their nests on a rock at the Dimhutti waterfall on the Nilghiris, twenty or thirty together. I have found one or two nests in deserted outhouses in Mysore; and they are said to breed very constantly on large buildings, old mosques, pagodas, and such like; hence the native name of Mosque-Swallow in the south of India; but I rather think there is a considerable increase of their numbers during the cold weather, and it was no doubt at the time of their northward migration that Colonel Sykes saw them in such vast numbers at Poona. The nest, as figured by Pallas and observed by myself, is a spherical or oval-shaped mud nest, with a long neck or tubular entrance, of the kind which is called a retort nest, and the eggs are white, faintly marked with rusty-coloured spots."

Miss Cockburn, writing from Kotagherry, says:—"I only once found a nest, and this was on the 9th April. It was constructed under a shelving rock, raised so high from the ground as to allow of my walking under it. The cave, if I may so call it, was in a wild, lonely locality, suggestive more of bears than Swallows."

"The nest, which was built of clay, was about $\frac{1}{2}$ foot long, the entrance being at one end. It was warmly lined with feathers, and contained three pure white eggs, very long in shape. As I wished to know if the number would be increased, they were left for a couple of days. On visiting the spot again, I found the length of the nest had been *increased* considerably, the eggs being left at the far end; but as there were no more than three, they were taken possession of."

I also have noticed the birds (or one of them) still building, and yet found eggs more or less incubated within.

The eggs are pure white, with scarcely any perceptible gloss; generally a long oval, occasionally somewhat pyriform in shape, and rarely very long and narrow like those of our Indian Swift. They are perfectly spotless, and so far as shape and size go the egg of *H. daurica* figured by Bree sufficiently correctly represents an average specimen. Many eggs, however, are longer and narrower than that figure, and while all are, as in the figure, somewhat pointed towards the end, some are conspicuously so.

The eggs vary from 0.75 to 0.83 inch in length, and from 0.52 to 0.6 inch in breadth; but they average about 0.78 by 0.55 inch.

825. *Hirundo hyperythra*, Blyth. *The Ceylon Swallow.*

Hirundo hyperythra, Blyth, Hume, Cat. no. 85 quint.

Colonel Legge writes in his 'Birds of Ceylon':—"The Red-bellied Swallow breeds in the north, south, and centre of the island from March until June, constructing a Martin-like nest in outhouses, open dwellings, or under culverts and bridges. The nest is composed externally of mud, and lined with feathers; it is large and the entrance is situated usually at the end of a spout, running from 3 to 6 inches along the planks at the top of the nest; some have merely a circular orifice at the top. One which I frequently observed during the course of its construction was built in a merchant's office at Galle, the familiar little architects taking no notice whatever of the clerks who wrote at their desks just beneath; it was completed in about three weeks, the spout being added last, and after this was finished one of the pair took up its position inside the nest, and received the feathers brought by its mate to the entrance. The eggs are either two or three in number, and some brought to me as belonging to this bird were pure white and pointed lengthy ovals in shape, much resembling those of *Cypselus affinis*; they measure 0.85 inch by 0.56 inch. I have not taken the eggs myself."

Family MOTACILLIDÆ.

Motacilla personata, Gould. *The Masked Wagtail.*

Motacilla dukhunensis, Sykes, *Jerd. B. Ind.* ii, p. 218.

Motacilla personata, Gould, Hume, Cat. no. 591.

Writing of *M. personata* in Afghanistan, Major Wardlaw Ramsay says:—"The Masked Wagtail (*Motacilla alba* of my first paper, Ibis, 1879, p. 448) was abundant, and was breeding

throughout May and June. On the 5th June I found a nest It contained five young birds, which had been hatched a few days. On returning to the nest on the 28th of the same month, the young had flown, and a second laying of three eggs was in the nest. In course of preserving the female, which I shot, I found in her a fourth egg, ready for laying. Another nest was placed in a recess under a large stone near the edge of the water."

***Motacilla hodgsoni*, G. R. Gray. *Hodgson's Pied Wagtail*.**

Motacilla luzoniensis, Scop., *Hume, Rough Draft N. & E.* no. 590.

Hodgson's Pied Wagtail breeds during May and June in Cashmere, where Mr. Brooks himself took several nests.

This Wagtail nests in holes, under large stones, in shingle beds of rivers, and in accumulations of drift wood.

Mr. Brooks says :—"Cock and I took several nests during our trip to Cashmere. The birds build under large boulders in the beds of rivers, where they would be destroyed if a flood took place causing the river to rise. One nest found by Captain Cook was inside a heap of drift wood."

Later, writing from the valley of the Bhagiruttee in the hills north of Mussoorie, he says :—" *Motacilla hodgsoni*, Gray, breeds near Danggulla and about Deralee, where there are suitable gravel-beds in the river. On the 11th May a female which I dissected had an egg nearly full-sized. Some of the birds I saw at this time had grey backs, others partly grey and partly black, and some had pure black backs. The male has a pretty song."

The eggs are typically somewhat broad ovals, pointed towards the small end, but somewhat more elongated, and occasionally slightly pyriform, varieties occur. The ground-colour is greyish white, sometimes with the faintest possible brownish tinge. Some are very minutely and thickly speckled all over, but most thickly at the large end, with pale brown and brownish grey; in others the markings, though still minute, are brighter, bolder, and more sparse, with here and there very faint, scarcely noticeable, inky-purple or grey clouds underlying the primary markings. The eggs, as might be expected, often very closely resemble those of both *M. alba* and *M. lugubris*, but are, I think, slightly larger.

In length they vary from 0.76 to 0.8, and in breadth from 0.6 to 0.64.

***Motacilla maderaspatensis*, Gm. *The Large Pied Wagtail*.**

Motacilla maderaspatana, Briss., *Jerd. B. Ind.* ii, p. 217; *Hume, Rough Draft N. & E.* no. 589.

The Large Pied Wagtail breeds throughout India from north to south, only avoiding the low country of Bengal Proper. In the Himalayas it is never found, I believe, at elevations exceeding

3000 feet, but it ascends the mountains of Southern India to any elevation at which water occurs, and breeds at Ootacamund.

Throughout the country, March, April, and May are the months in which they chiefly lay, more eggs being met with in April than in any other month; but on the Cauvery my friend Mr. H. R. P. Carter met with eggs both in December and January.

They always nest in the neighbourhood of water, but, with this sole reservation, they place their nests almost anywhere. These may be found in holes in banks, crevices in rocks, under stones, under clods of earth, amongst the timbers of bridges, in drains, holes in walls, on roofs, and in fact anywhere except on shrubs or bushes. The nests are always down on something solid, and that is about all that can be said.

In the middle of the River Jumna, at Agra, there is an iron buoy attached to the puntoon bridge, which is surmounted by an iron ring, which lies down nearly horizontal, and in this ring for several successive seasons a pair of Pied Wagtails nested, within 5 yards of the roadway, and in full view of the thousands of passengers who daily cross the bridge. In the Chumbul, a little above its junction with the Jumna, a pair built in the clumsy old ferry boat which was but seldom used, and when the female was sitting she allowed herself to be ferried backwards and forwards, the male all the while sitting on the gunwale singing, making from time to time short jerky flights over the water and returning fearlessly to his post.

In this latter case the nest was nothing but one of those small circular ring-pads, say 4 inches in external diameter, and an inch thick at the circumference, which the women place on their heads to enable them to carry steadily their round-bottomed earthen water-vessels; a dozen tiny soft blades of grass had been laid across the central hole, and on these, of course bending them down to the surface of the massive boat-knee on which the pad had been accidentally left lying, the eggs were laid.

The character and materials of the nest are quite as various as are the situations in which it is placed; as to character it varies from nothing (for they will lay in a tiny depression on the bare earth) up to a neat well-formed saucer or shallow cup; as to materials, nothing tolerably soft seems to come amiss to them: fine twigs, grass-roots, wool, feathers, horse-, cow-, and human hair, string, coir, rags, and all kinds of vegetable fibres, seem to be indifferently used.

It is impossible to generalize satisfactorily in regard to the nidification of such irregular-minded birds as these, and it will be well to quote a number of different accounts to illustrate the matter properly; and I need now only add that four is the normal number of the eggs, that I have twice (out of perhaps a hundred nests) met with five, and that I have frequently found only three more or less incubated, as well as only three young ones.

First, to quote an old note of my own recorded at Etawah:—
“Found three nests of this bird on the 14th March, 1867, on the

banks of the Jumna, near Sheregurh; two were built inside clusters of kunker rocks, completely under overhanging slabs, and one was so situated that one's hand could hardly reach it. The nests were circular, about 5 inches in diameter and about 2 inches thick, with a central 3-inch diameter and an inch-deep depression. The nests were rather solidly woven with grass-roots and grass, and thickly and warmly lined—the one with cotton-wool and a little sheep's wool and human hair; the other with cotton-wool, a few soft duck's feathers, some soft tow, and several pieces of soft native cotton-thread: the one contained four perfectly fresh, the other three slightly incubated, eggs.

"The third nest was under the curving side of a huge log of sal stranded a few feet above the present water-level. It was very solidly woven of hair, a great proportion of which was human, and the rest of cows and horses. There were only two eggs, and they were fresh."

Colonel G. F. L. Marshall tells me "that this bird breeds commonly in the Saharunpoor District on the flat roofs of the canal chokies, or in the small ventilating holes in the wall; sometimes it makes an elaborate and very neatly constructed nest of twigs and grass thickly lined with hair and feathers; at other times the eggs are deposited on the bare sand which lodges in the drain-pipes at the corners of the roof. The eggs are four in number, and differ much in size and colour."

The late Mr. A. Anderson remarked:—"Several pairs of these Wagtails breed annually at Futtegurh; their favourite place appears to be the bridge of boats. The nest is usually placed inside a 'pigeon-hole,' either at the bow or stern of a boat, and is a large solid structure, well lined with wool and tow.

"The eggs are usually four in number, and I have known the same pair to lay a second clutch very soon after the first batch had been removed. They do not begin to build till the end of April or beginning of May.

"Two years ago I found *M. maderaspatana*, *Columba intermedia*, and *Coracias indica*, a pair of each, building in the same boat: the Wagtail's nest was on a rafter under the planks, and the other birds occupied 'pigeon-holes' or niches at either end of the boat."

From Sambhur Mr. R. M. Adam notes that "the Pied Wagtail is very common about all the open wells and tanks. They build during April and May. Although I have been looking out for the nest of this bird for some time, the first I found was on the morning of the 18th April. I then noticed an adult catching a large dragon-fly, and as it did not proceed at once to devour it, I thought that it might be for its young. After flirting about for fully five minutes with the fly in its bill, it popped into a hole at the very water-level of a tank near to my house, and immediately reappeared without the fly. On examining the hole I found a nest containing three full-fledged nestlings and one addled egg. The nest was a longish oval, about 7 inches in length and 4 inches in breadth; in thickness it was about 2 inches. It was composed of

pieces of twine, cloth, fibres of plants, feathers, and a large proportion of human hair. Round the outer edge there was a rim formed, I presume, to keep the young in the nest. The egg-receptacle was quite flat, and lined with a few feathers, horsehair, wool, and fibres firmly matted together. On the 1st May I observed another bird building, and found its nest in a hole in the bank of an open well. The nest had just been commenced; on the 3rd it was finished, and on the 7th it contained two eggs, which I took with the nest. Another bird I watched finished its nest on the 7th May, and on the 9th, 10th, 11th, and 12th it laid an egg each day. The eggs are dirty white in colour, much speckled and spotted with pale brown and dusky; at the broad end the spots are massed together, while in one egg they form a zone."

From Hoshungabad Mr. E. C. Nunn writes:—"On the 11th April we found a nest in a low bank in the bed of the Nerbuddah. It was composed of a mixture of wool, hair, feathers, grass-roots, pieces of thread and hemp, and bits of cotton. On the very next day we found a second precisely similar nest in a similar situation. Each nest contained two fresh eggs."

At Ahmednuggur, in the Deccan, the Rev. H. J. Bruce recorded the following note:—

"26th April, 1869.—Found a nest of this bird containing four fresh eggs. The nest was situated on a shelf under a projecting rock in the perpendicular bank of the river; was but 6 or 8 inches above the water-level, and 15 inches from the edge of the bank. It was composed of coarse sticks upon the lower and outer sides, above which were finer sticks and roots of grass lined with hair. The whole was so loosely put together that it was with difficulty removed from its place. The outer side was built up with sticks nearly 4 inches, while the inner side was scarce an inch thick.

"The egg-cavity was $2\frac{1}{2}$ inches in diameter and $1\frac{1}{4}$ inch in depth. The eggs were of bluish-white colour, thickly covered with light brown blotches which often run into each other. On the larger end of one specimen these blotches form an irregular circle, while the other three have the whole larger end more or less thickly covered."

Writing from Poona about this species, Mr. E. Aitken remarks:—"I found a nest on the 17th of last April. It was on one of the barrels on which the platform of the boat-club floats. By raising one loose plank, I got a look at the nest, and thought I distinguished three young ones, nearly fledged. They had a nest in the very same situation (on the identical barrel, I believe) last year."

Colonel E. A. Butler writes:—"The Pied Wagtail breeds at Mount Abou round the lake in March and April, placing its nest in holes of stone walls, which are often made at the edge of the water to support the road leading round the lake. The cock-bird during the period of incubation generally sits upon some big rock which, rising above the surface of the water, forms an island at no great distance from the nest."

He adds:—"The Pied Wagtail breeds in the neighbourhood of Deesa in the early part of the year. I found a nest in the hole of a river-bank on the 9th April, 1870, containing three half-fledged young ones; the parent birds kept flying backwards and forwards to the nest with small dragon-flies in their mouths. I found another nest at Sattara in September 1872, in a small hole cut as a step in the stonework of a well by the side of a large tank."

Mr. W. Davison says:—"The Pied Wagtail breeds in April and May on the Nilghiris. I have taken the nest from the bank of a stream, between the beams of an old bridge, and for several years in succession from a slit in a rock in the Ootacamund Lake. The nest is chiefly composed of grass and grass-roots, lined with fine dry grass."

Writing from the banks of the Cauvery Mr. H. R. P. Carter records that on the 17th December, 1866, he "found a nest in the space between the girder of a bridge and the wall. The nest was made principally of coir, lined with bullock's hair; it was shallow and not well formed. Eggs three, very broad and blunt at one end, and pointed at the other.

"20th January, 1867.—Again examined the old nest and found that it had been strengthened by some rags, otherwise was much as last year's. There were two eggs in it this time."

Messrs. Davidson and Wenden, writing of the Deccan, say:—"Common, and breeds in cold weather and rains."

The eggs differ very much in size and shape, and vary from a long to a rather broad oval. They are always more or less pointed towards the small end. In the general shade of the egg and in the colour and extent of the markings they vary excessively. There are, however, two leading types—the one in which the prevailing tint is greenish, a greenish-white ground with greenish-brown markings; and the other in which the general colour is brown, dingy wood-brown markings on a pale earthy-white ground. Each of them again is divisible into two classes—those in which the markings are comparatively distinct, and leave a good deal of the ground-colour, especially towards the small end, visible; and those in which they are nearly confluent everywhere, only leaving the ground-colour to peep through in specks or as a feeble paler mottling. Even this last class is again divisible into two types—one in which the markings are excessively close speckling, and the other in which they are close smudgy mottling. All the varieties that their eggs exhibit are reproduced amongst those of our Larks, and both in their nesting-habits and the character of their eggs there seem stronger affinities between the Wagtails and the Larks than would be surmised from their plumage and external appearance. Generally it may be said that the ground-colour (of which more or less is visible in different specimens) varies from pale brownish to greenish white. The markings are clouds, smudges, streaks, spots, and specks; sometimes all these forms are exhibited in one and the same egg, but most commonly one or other form greatly predominates, so as to give its own peculiar character to

the egg. The colour of the markings is sometimes earthy brown, sometimes dark olive-brown, and sometimes purplish brown. In some eggs the whole surface is covered with markings more or less uniformly; in others they are far more dense on the large end, and comparatively sparse elsewhere.

In length these eggs vary from 0·82 to 0·98, and in breadth from 0·6 to 0·7; but the average of twenty-nine eggs is 0·9 by rather less than 0·66.

Motacilla melanope (Pall.). *The Grey Wagtail.*

Calobates sulphurea (Bechst.), *Jerd. B. Ind.* ii, p. 220.

Calobates boarula (Penn.), *Hume, Rough Draft N. & E.* no. 592.

The Grey Wagtail breeds plentifully, Mr. Brooks tells us, along the mountain-streams of Cashmere, at elevations of above 6000 feet.

All the nests of which I have received any record were taken during the latter half of May and the early part of June.

Four or five appear to be the usual number of eggs.

Mr. Brooks remarks:—"I have examined a good series of both of *Calobates sulphurea* and *C. melanope*, Pallas, and though the coloration is the same, there is such a very great difference in length of tail that I cannot conclude them to be the same.

"The situation chosen for the nest is different, and *C. melanope* is not nearly such a noisy bird when breeding as *C. sulphurea*.

"One nest that I found in Cashmere, at Kagan, was placed in a small bush on an island in the Sind River, about 5 feet above the ground. The situation was that of a Finch's nest! It was composed of moss, fibres, &c., and lined with hair, a neat compact nest, and placed in the forks of the branches near the top of the bush.

"The other nest was placed under a large boulder on the dry bed of the river, and was composed of the same materials. The eggs out of this nest were more pinkish than those of any *sulphurea* I have ever seen."

Major Wardlaw Ramsay says, writing of Afghanistan:—"Commenced to breed in May. On the 5th June I found a nest in the roots of a tree which was lying in the dry bed of the stream near our camp; it contained four young ones just hatched, and one addled egg, which I secured with the old bird."

The eggs are pretty uniform, both in size and shape—broad ovals at the larger end, and much compressed and pointed towards the small end. Typically the ground-colour is yellowish or brownish white, closely mottled and clouded all over with pale yellowish brown or brownish yellow; these markings, always pale, dull, and smudgy, are somewhat darker in some specimens and lighter in others. Almost all the eggs have a very fine black hair-like line twisted about somewhere near the large end. Mr. Brooks took a nest, which he feels certain belonged to this bird, in which the eggs are similar in shape, size, and character of markings to

those which I have above described as typical, but which had the ground-colour pale salmon-pink and the mottling a darker, slightly brownish, salmon-colour.

In length the eggs vary from 0·68 to 0·73, and in breadth from 0·53 to 0·55.

***Motacilla citreoloides* (Hodgs).** *Hodgson's Yellow-headed Wagtail.*

Budytes citreola (Pall.), *Jerd. B. Ind.* ii, p. 225.

Budytes calcaratus, *Hodgs., Hume, Rough Draft N. & E.* no. 594.

Hodgson's Yellow-headed Wagtail, figured by Gould, breeds in Cashmere, where it is excessively plentiful during the season, but only one Indian oologist appears as yet to have taken its eggs.

Mr. W. Theobald makes the following remarks on its nidification in the Valley of Cashmere:—"Lays in the third week of May; eggs, four in number, ovato-pyriform; size, 0·95 by 0·70; colour, pale grey, thickly dotted and ringed with greenish-brown and greyish-neutral mingled together; a depression in soft earth beneath a rock: valley generally."

***Anthus trivialis* (Linn.).** *The Tree-Pipit.*

Pipastes arboreus (Bechst.), *Jerd. B. Ind.* ii, p. 229.

Pipastes plumatus (Müll.), *Hume, Rough Draft N. & E.* no. 597.

A pair of Tree-Pipits, obviously breeding, were brought to me in the flesh at Kotegurh on the 6th May, together with a nest containing three fresh eggs.

They were all alleged to have been procured two days previously on the snowy hills north-east of Kotegurh and on the other side of the Sutlej.

The nest was nearly circular, a shallow saucer composed of grass and lined with fine grass-stems and a little hair, and had been placed on the ground at the foot of a tuft of grass. It was found high up, close below the snow-line, while the men were shooting *Tetraogallus himalayanus*.

No one can rely upon what native huntsmen say, but the birds, as dissection showed, were breeding, and I believe the eggs to be genuine.

They are very broad ovals, very slightly compressed towards one end. The shell has but little gloss; the ground-colour is greyish white with a faint pinkish tinge, and the eggs are pretty thickly speckled and spotted all over, and very densely so at the large end, with dull purple and purplish brown.

They vary from 0·83 to 0·86 in length, and from 0·59 to 0·67 in breadth.

Anthus maculatus, Hodgs. *The Indian Tree-Pipit.*

Pipastes agilis (Sykes), *Jerd. B. Ind.* ii, p. 228; *Hume, Rough Draft N. & E.* no. 596.

The Indian Tree-Pipit, so common throughout the plains of India from north to south during the cold season, breeds but sparingly, if at all, within our limits.

All I know of its nidification is that a loose grass nest, containing a single egg, taken on the 3rd June, and a male bird (said to have been shot on the nest) were sent to me from Upper Kooloo. The nest was found on the snowy range bounding Spiti, at an elevation of probably 11,000 feet, at any rate above the Pines.

Even if this was not the nest of the Pipit, the latter must, from the season, have been breeding somewhere near, and this chiefly is my reason for mentioning the fact.

I entertain no doubt of the good faith of my correspondent, but he is no ornithologist: and the egg is so large, and so closely resembles those of *Oreocorys sylvanus*, of which several accompanied it, that I feel by no means sure of its authenticity. The egg is a moderately broad oval, slightly compressed towards one end, has a greyish-white ground, and is thickly and minutely speckled and spotted all over with two different shades of rather pale dingy purple. It is clearly the egg of a Pipit of some kind or other, but, as I said before, I cannot vouch for its authenticity. The egg has only a very faint gloss. It measures 0·93 by 0·68.

The late Mr. A. Anderson was fortunate to find nests of this Pipit himself. He writes:—

“Pushing on as quickly as possible for the region of the snows, I arrived at Dhakuri Benak, which is at an elevation of nearly 11,000 feet, on the 15th May. This was reputed to be almost a sure find for Woodcocks, and it was marked off in my chart as one of the chief places to be visited. Great, however, was my grief when I was obliged to quit the place without ever flushing a bird, notwithstanding that I employed an additional staff of coolies and offered most tempting rewards for even the sight of one.

“But though I had here to take temporary leave of the Woodcocks, I did not leave Dhakuri empty-handed, for the very last pieces of cover I drew, out flew a Pipit from a tussock of long grass, under the shelter of which was placed the nest, which contained four hard-set* very black-looking eggs of the much-disputed (by *European* ornithologists, I should add) Indian or *Green-backed* Pipit (*Anthus maculatus*). The nest was deeply placed in the damp

* These eggs were on the point of hatching, but I saved them by means of carbolic acid. It may not be generally known that small eggs can be preserved in this way by making a largish hole and inserting pieces of cotton-wool tightly rolled into small pills well saturated with the acid; they should thus be *stuffed to the utmost*, and then allowed to dry. Eggs prepared in this way (i. e. when they are too far incubated to admit of being blown) never go bad.

(almost wet) ground, and it was a large massive structure of green moss lined internally with fine grass-stems. The bird, during the time I was engaged in examining the nest and eggs, stood motionless on the grassy slope, not more than ten yards from where she had been flushed, eyeing me all the while with outstretched neck, and remained in that position till I shot her.

"These eggs are very large for the size of the bird, much more so than the usual run of the eggs of kindred species (*Anthus arvensis* and *A. pratensis*), and larger than a second sitting of fresh eggs which I obtained later on. On the same day several more old birds and two fully-fledged young ones, while in the act of being fed by their parents, were brought to bag.

"I next encountered the same species in great abundance at Furkia, on the banks of the Pindar, close under the glacier, at an elevation of 12,000 feet. My camp here was pitched on solid ice, and it snowed heavily during the night: it was indeed an 'abode of snow.' Here I saw *Aquila chrysaëtus*, gyrating over the snow-capped peaks, and *Pyrhacorax alpinus* for the first and only time. *Chaimarrornis leucocephala*, *Ruticilla fuliginosa*, *Encurus scouleri*, and *Hydrobata asiatica* were my constant companions, and were to be seen enjoying themselves on the spray-covered boulders in the foaming torrent; while my paharees shared the same cave with *Columba leuconota*, and amused themselves by catching marmots (*Arctomys hemachalanus*).

"Here, with the snow lying several feet deep on the ground, I found my second nest of *Anthus maculatus*: it contained three callow young; but as the nest-architecture differed very materially from the first one, and as the parent birds were so terribly wild, I was necessitated to have the sitting bird noosed on the nest; shooting it was quite out of the question. This nest was composed entirely of grass-bents, a very shallow saucer-like affair without the addition of any moss or warm materials, as in the first one.

"The third and last nest, containing four beautiful fresh eggs of the same dark type as the first clutch, was taken at Bepulla on the 14th of June. This one, as regards position, size, and materials, was exactly similar to the second one above described.

"To sum up. *Anthus maculatus* affects by preference the more open grassy mountain-slopes in the immediate vicinity of woods, at elevations from 7000 to 12,000 feet; these open glades in Northern Kumaon are thinly covered with trees and overgrown with beautiful thick, soft, *velvety* grass, about a foot high, with occasional tussocks, especially in the neighbourhood of sheep-pens, sufficiently dense and high to afford cover to a hare. This, at any rate during the breeding-season, is *par excellence* the abode of both *Anthus maculatus* and *A. rosaceus*, which are the only two species of Pipits to be met with at so high an elevation.

"The birds on these undulating meadows, at times stretching away for miles, and covering the crest of some of the highest spurs, are extremely lively and very difficult to approach. You have frequently to go on 'all fours,' taking advantage of every hollow and

irregularity on the ground before you can get within shooting distance of them, and by the time you have bagged three or four you are completely done up, notwithstanding the thermometer registers only 50°. Once flushed, they become doubly wild, and at the first approach of danger rise perpendicularly almost out of sight, with a series of jerky flights, at times poisoning themselves in mid-air, very much after the fashion of the Sky-Lark.

"In its nidification it resembles *Anthus arboreus*. The nest, as I have already mentioned, is constructed of dry grass-blades, and it is well concealed under a tussock of overhanging grass. The eggs, however, are very different from those of the sister species, and resemble very dark varieties of *Anthus pratensis*; in short, they are very like Hewitson's second figure of the Meadow-Pipit's egg, a variety which that author says is seldom met with.

"Although I explored many miles of good ground where these birds were plentiful, I procured only three nests; the conclusion to be arrived at is that the majority of them are late breeders, say from the latter end of June to July.

"Mr. Brooks, who has been so good as to examine my series of this bird, pronounces them, one and all, to belong to the typical *Anthus maculatus*. The chief specific characters of this species, as has now so frequently been referred to, consist in the narrow ill-defined striations on the back, which is an *olive-green* colour, and in having the posterior half of the supercilium *pure white*. I never once came across *Anthus arboreus*, which would appear to summer much further north, probably from Thibet to Yarkand."

***Anthus nilghiriensis*, Sharpe. *The Nilghiri Pipit*.**

Pipastes montanus (Jerd.), *Jerd. B. Ind.* ii, p. 230; *Hume, Rough Draft N. & E.* no. 598.

Mr. Davison brought me a skin, nest, and four eggs of the Nilghiri Pipit from the Nilghiris, and informs me that they were obtained in May at Neddivattam, at an elevation of about 6500 feet; the nest is a shallow cup of grass loosely put together and lined with finer grass. He snared the bird on the nest. He remarks:—

"This bird breeds at Ootacamund and its immediate vicinity, and also down the slopes to about 6000 feet. The nest is placed under a tuft of grass, or bush, on the side of a hill, and is composed of dry grass lined with finer grass. The eggs, two or three in number, are pale dingy greenish brown, thickly mottled with a darker shade. The bird breeds in April and May."

The eggs vary in shape from rather broad to moderately elongated ovals, and one of them is a good deal compressed and somewhat pointed towards the small end; they are dull-looking eggs, with scarcely any gloss. The ground-colour, of which by the way the markings leave little visible, varies in every egg: in the four before me it is pinkish-, greenish-, greyish-, and creamy-white, and

it is freckled, mottled, streaked, and blotched all over, but as a rule most densely towards the large end, with dingy brown or purple, of different shades in different eggs, or both. In one egg the whole of the markings are a dingy brownish-pinkish-purple; in another they are a mixture of sepia-brown and very pale inky purple; in another all sepia-brown of different shades; while in a fourth the brown is slightly yellower.

In length the four eggs vary from 0.79 to 0.89, and in breadth from 0.59 to 0.62.

Anthus sordidus, Rüpp. *The Rufous Rock-Pipit.*

Agrodroma cinnamomea (Rüpp.), *Jerd. B. Ind.* ii, p. 235.

Agrodroma similis, *Jerd., Hume, Rough Draft N. & E.* no. 603.

Miss Cockburn says:—"The Rufous Rock-Pipit is considered a very rare bird, even on the Nilghiris. It is also extremely shy, never approaching the habitation of man, and if a human being trespasses on its wild retreat it instantly mounts high up in the air, as if trying to escape his reach.

"Dr. Jerdon has figured this species in his 'Illustrations of Indian Ornithology,' and says he has met with it 'on the Segoor Pass of the Nilghiris among rocky ground.' A nest of this rare bird was found on this very Pass under a shelving rock; it was formed of fine grass, and contained only one egg. No doubt the bird would have laid others, but it was too precious to an oologist to be left even for a day, and therefore was brought safely away. This egg was very much like a Lark's except that a greater number of spots make it appear darker. It was found in the month of March."

Subsequently she obtained another nest, and favoured me with two eggs. They very closely resemble those of *Alauda malabarica*, *Jerd. nec Scop.*, but are more glossy. They are moderately elongated ovals, somewhat compressed and pointed towards one end, with a creamy-white ground densely but *very minutely* freckled and speckled all over with what on close examination proves to be very pale yellowish brown and pale purplish grey. The markings are almost uniformly distributed over the whole surface, but they are slightly more dense at the large end.

These eggs were taken on the 16th May, and measured 0.85 and 0.86 by 0.65.

Anthus jerdoni (Finsch). *The Brown Rock-Pipit.*

Agrodroma sordida (Rüpp.), *Jerd. B. Ind.* ii, p. 236.

Agrodroma jerdoni, *Finsch, Hume, Rough Draft N. & E.* no. 604.

I have never myself succeeded in finding a nest of the Brown Rock-Pipit, and, looking to the eggs of this species sent me by Colonel Marshall, those brought by Mr. Thompson's men from

Gurhwal and described in 'Lahore to Yarkand,' p. 76, cannot have belonged to it.

From Murree Colonel C. H. T. Marshall writes:—"Rough-made nest of grass. Breeds from May till middle of July, low down the hill-side. Lays four eggs, much resembling the eggs of other species of this family. We took six nests, and twice found the Common Cuckoo's eggs in them. They do not breed above 6000 feet up."

The eggs sent me by Colonel Marshall are barely, if at all, separable from those of *Oreocorys sylvanus*. I have a great number of the eggs of this latter species, many taken with my own hands, so that there can be no doubt, I think, as to the authenticity of these. Colonel Marshall, again, has taken numerous nests of the present species, and he is equally certain of the authenticity of his eggs; either one or other of us is wrong, or it is a fact (which is hardly credible) that the eggs of *Oreocorys sylvanus* and *Agrodroma jerdoni* (*A. sordida*, Rüppell *apud* Jerdon) are inseparable!

Major Wardlaw Ramsay, who found the nest of this Pipit in Afghanistan, unfortunately merely remarks:—"I found the nest on the 22nd June under a small bush at the foot of a rock. It was neatly let into the ground, and contained three eggs, which I regret not being able to describe, as my collection of eggs has not yet arrived from India."

The eggs sent by Colonel Marshall are moderately broad, fairly regular, ovals, somewhat compressed or pointed towards one end; the shells are compact and fine, but almost entirely devoid of gloss. The ground-colour is a brownish or greyish white, and they are profusely speckled, spotted, and streaked, and in places blotched and clouded, with a sort of sienna-brown and a pale dingy half-washed-out colour, which varies from pale sepia to pale inky purple. The markings are everywhere thickly set, but they are much most dense towards the large end, where they very generally form a more or less confluent cap. Some of the eggs have all the markings somewhat purple, and others have them browner. In length these eggs vary from 0·82 to 0·87, and in breadth from 0·62 to 0·65.

Anthus rufulus, Vieill. *The Common Pipit.*

Corydalla rufula (Vieill.), *Jerd. B. Ind.* ii, p. 232; *Hume, Rough Draft N. & E.* no. 600.

The Common Pipit or Indian Tit-Lark breeds (though, according to my experience, somewhat sparingly) all over the plains of India, as also in the Himalayas, up to elevations of 5000 or 6000 feet.

I have very seldom found its nest; the few I have seen have all been placed on the ground and under or in the midst of tufts of grass. All have been shallow or saucer-like nests, composed of

grass and roots and lined very scantily with finer roots. Three eggs is the largest number I have seen in one nest.

The breeding-season certainly extends from March to July, but the three nests I have myself taken in Upper India were all found in April.

A nest of this species, taken by Mr. F. R. Blewitt at Saugor on July 16th, and kindly sent to me by that gentleman, was a shallow ragged saucer some 4 inches in diameter, with an egg-cavity an inch deep. It was composed almost entirely of very fine brown rootlets, looking for all the world like a lump of oakum, intermingled with a few pieces of grass, and with a mere pretence for a lining of fine grass-roots. The fine oakum-like rootlets were fitted together so as to make the bottom and sides of the nest, comparatively speaking, very firm.

Colonel G. F. L. Marshall tells us that "the Indian Tit-Lark breeds in the Saharunpoor District in March, the eggs being hatched in the first half of April.

"The nest is placed on the ground, under a tuft of grass or against a clod in the open field. A nest taken on the 24th March with three slightly-set eggs was placed against, and half under, a large clod, with grass growing on it, which bending over completely concealed the nest; it was cup-shaped and composed of grass and grass-roots and fibre, much coarser and more strongly put together than the nest of the Crested Lark. There was no perceptible lining. The egg-receptacle was $2\frac{1}{4}$ inches in diameter and nearly 2 inches deep.

"The eggs, three in number, were of a slightly yellowish-white colour, profusely and boldly spotted and blotched with yellowish brown and dingy purple, the markings being most numerous towards the larger end, where they exhibit a tendency to form an irregular confluent cap."

According to Mr. Hodgson's notes, this species "breeds in Nepal, laying in March and April, the young ones being ready to fly in June. They build their nests under the shelter of some clump of grass or overhanging clod, constructing it of dry grass and cow-hair, which they round into a very shallow pad-like nest. They lay three or four eggs."

Dr. Jerdon states that "it makes its nest on the ground in April and May, under a slight prominence or in a tuft of grass, or at the edge of a bush, and lays three or four eggs, of a greenish ground-colour, with numerous small brown specks, chiefly on the larger end."

This Pipit has been found breeding by Mr. Doig in the Eastern Narra districts.

Colonel Butler writes from Deesa:—"April 30th, 1876. Found a nest of the Indian Tit-Lark, containing three young birds about a fortnight old, so that the eggs were probably laid about the end of the third week in March. The nest was placed on the ground in the centre of a small tamarisk-bush growing on some hard, bare, incrustated ground in the bed of the river. It was a well-built

nest, consisting of fine light-coloured roots and grasses intermingled with a considerable quantity of oakum woven together and lined with similar materials, but finer, and a few horsehairs. A considerable-sized hole had been excavated for the admission of the nest. The two parent birds kept running (Wagtail-like) to and fro with insects in their mouths, principally small dragonflies, which they caught along the edge of the water."

He subsequently wrote from Belgaum:—

"*Belgaum*: 14th June, 1879, a well-built nest under a tussock of grass on a rocky 'maidan,' containing three incubated eggs. Another nest on the 22nd June, containing three fresh eggs. 30th June, two nests, one containing a single fresh egg, the other three young birds about ten days old. All of the above nests were in the same locality and in precisely similar situations. The nests were all compact and well built, and in some instances had a slight canopy, evidently as a protection from the rain.

"*Belgaum*: 28th March, 1880, a nest by the side of a tussock of grass, containing three half-fledged young ones. The nest was on a bare 'maidan' in a very exposed situation. April 4th, visited two nests that I had left on the 2nd April, each then containing two fresh eggs, and found them both empty and deserted. One nest was very solidly built of dry grass, coarse exteriorly, fine interiorly, and completely hidden under the grass, having a run up to it through the grass, and would never have been discovered unless the old bird had been seen going to and from it whilst building. The other was in a tussock of coarse grass in a comparatively open situation. In the breeding-season these birds rise into the air constantly, much like *Pyrrhuloxia grisea* or *Chortornis locustelloides*, and, after soaring about singing for a short time, descend, Lark-like, with wings and tail spread, usually settling on some low bush or bank near the nest. I notice that in the breeding-season these birds perch constantly on low bushes. April 11th, a nest on an open 'maidan' in a tussock of grass, containing three incubated eggs. As a rule, when nests are built on a maidan exposed to the wind, such as we have in this neighbourhood, they are invariably placed on the leeward side of the tussock, and usually have a canopy over the top to protect them from the wind. The nest thus resembles a ball of grass with a good-sized entrance at the side.

"On the 17th of April I found another nest, containing three fresh eggs, and, placing a horsehair noose at the entrance, caught the hen bird in a few minutes. On the 18th April I took another nest with three fresh eggs; and on the 19th April found three nests, each containing a single fresh egg. Two more nests on the 23rd April, each containing three incubated eggs; and one on the 26th April, containing three fresh eggs. 27th April, another nest containing three fresh eggs, and one containing three incubated eggs.

"2nd May, two nests, each containing three incubated eggs. 16th June, a nest containing four fresh eggs: this is the first time I have ever seen more than three eggs in one nest. 20th June,

three fresh eggs. 25th June, a nest in the hole of a bank by the road-side containing *four* fresh eggs."

Colonel Legge informs us that this Pipit breeds in the west and south of Ceylon during May, June, and July.

Mr. J. R. Cripps, writing from Furreedpore, in Eastern Bengal, says:—"Common, and a permanent resident. Found in high cultivated fields and paddy-fields. Breeds during April and May under tufts of grass, on the sides of embankments, &c. The nest is made of fine grasses, cup-shaped; very often a hollow is taken advantage of, and this the bird fills neatly with grass. Some birds breed even in June."

Mr. Oates remarks that this Pipit breeds commonly all over Burma in suitable localities from March to May, or even later.

The eggs, very variable both in shape and tint, are generally moderately broad and rather perfect ovals, scarcely at all pointed towards the small end, and in size and shape closely resemble those of the Common Tit-Lark. The ground is typically a brownish or greenish stone-colour, and it is thickly streaked, clouded, and streakily spotted, sometimes with dull brownish and purplish red and sometimes with brown of different shades, or brown intermingled with pale purplish grey. The markings are not unfrequently greatly more dense at the large end, where they have a tendency to become confluent, and where they are often more or less united by a dull dingy purple or brownish nimbus. Some eggs are altogether paler, having the ground a greyish white and the markings minute, more speckly, and better defined than those first described.

In length they vary from 0.75 to 0.86, and in breadth from 0.57 to 0.63.

Anthus rosaceus, Hodgs. *Hodgson's Pipit*.

Anthus cervinus (Pall.), *Jerd. B. Ind.* ii, p. 237.

Anthus rosaceus, *Hodgs., Hume, Rough Draft N. & E.* no. 605.

My friend Mr. R. Thompson sent two men, one an experienced shikaree and the other a stuffer, into Upper Gurmwal to procure birds and eggs for me, especially those of the larger Pheasants. The men returned with numerous skins, but without a single egg of the species they had been directed to search for. They brought with them, however, two nests of eggs which they had found on the ground, along with a skin of one of the parent birds belonging to each nest. The skin pertaining to the one nest was that of *Anthus jerdoni*, the other was that of *A. rosaceus*. The men had never been instructed to search for eggs of this kind—they had no earthly object in deceiving. The birds are both very common in the interior where they were, and the shikaree was not likely to have been himself deceived as to the bird really belonging to the egg he brought. There was, therefore, a pretty fair presumption that the eggs were what they purported to be; but, for all that, it

is pretty certain, from Colonel Marshall's experience, that their pretended eggs of *A. jerdoni* did not pertain to that species; and it may therefore well be doubted whether the eggs they produced as those of Hodgson's Pipit can be at all relied on. Future investigations must decide this point.

The eggs are moderately broad ovals, scarcely pointed at all towards the small end, but greatly resembling in shape (though somewhat larger) and in the character of their markings those of *Anthus rufulus*. The ground-colour is a ruddy cream, and they are very thickly streaked and clouded and streakily spotted with red and purplish red. Strange to say, though the character of the markings is very different, the colours recall those of some varieties of our Bulbul's. They have, like those of *A. rufulus*, a faint gloss. They measure 0·8 and 0·82 by 0·65.

They were obtained on the 27th May in Upper Gurhwal, at an elevation of over 12,000 feet. The nest was found on the ground in a small depression and under the shelter of a tuft of grass. It seemed to have been a flat saucer some 4 inches in diameter, and was composed entirely of dry grass.

A nest of this species obtained by Mr. Mandelli's people in the Dolaka District of Nepal on the 5th May is a mere pad of fine grass-stems loosely twisted together, and with a few dry pinnae of some *Pteris* incorporated at one side. It appears to have been circular, about 3·5 in diameter and 0·75 in thickness. It was placed on the ground in a little depression amongst grass, and contained two fresh eggs.

An egg said to belong to this species, obtained by Mr. Mandelli in the neighbourhood of Darjeeling on the 19th May, 1875, resembles a Lark's egg. It is a very regular rather elongated oval. The ground-colour appears to be greyish white, and it is very thickly freckled over its whole surface with a very pale earthy brown, which is slightly darker in patches and especially in a zone near the large end. The egg has scarcely any gloss. It measures 0·85 by 0·60.

Oreocorys sylvanus (Hodgs.). *The Upland Pipit.*

Heterura sylvana, Hodgs., *Jerd. B. Ind.* ii, p. 239; *Hume, Rough Draft N. & E.* no. 606.

The Upland Pipit breeds throughout the middle ranges of the Himalayas east of the Beas, at elevations of from 4000 to 7000 or 8000 feet. Westward of the Beas, I daresay, it may also breed, but I have no record of the fact. I have myself found the nests in Kooloo, in the Sutlej Valley, at Simla on Jacko itself, and near Mussoorie. In Kumaon I found young ones just able to fly, and Mr. Hodgson obtained the eggs in Nepal.

The breeding-season lasts from April to July, but the majority of the birds lay in the neighbourhood of Simla in the last fortnight of May and the first week in June. I have obtained young birds

barely able to fly in September, and either some pairs rear a second brood or else some breed very late.

All the nests that I have seen have been composed entirely of soft grass, rounded into a more or less shallow, saucer-like shape, in some cases too loosely put together to bear removal, in others tolerably compactly interwoven. I think the nests average nearly 5 inches in diameter, and scarcely more than an inch in thickness.

They are always placed on a hill-side—an open more or less grassy slope—under some overhanging tuft of grass or projecting rock, and as a rule pretty well screened from view.

The female, I think, alone sits. The male, however, is always at hand, uttering from time to time a single whistling note, followed by a single clacking note often repeated, sometimes on the ground and sometimes as he descends, after a short flight, with open wings, like the Tit-Lark at home.

Four is the usual complement of eggs, but I have found five.

I again notice the fact that the numerous eggs of this species which I possess and have seen, many of them taken by myself, are, as far as I can judge, absolutely undistinguishable from the eggs sent me by Colonel C. H. T. Marshall as those of *Anthus jerdoni*. I feel disturbed about this. I cannot see how I can have made any mistake. There were a pair bred on Jacko whom I watched building their nest, and then watched the eggs laid, one a day till there were four. The birds cannot be confounded. It is almost impossible that these widely different birds should lay precisely similar eggs, yet Colonel Marshall is certain of those he obtained.

Mr. Hodgson notes that he took a nest of this species in the valley of Nepal on the 4th May. The nest was on the ground, on a slope shaded by a tuft of grass, and overhung by a large clod of earth; it was a shallow cup, some 6 inches in diameter and 2 in height, loosely made of fine dry grass and devoid of lining, and contained four eggs, figured as *precisely* similar to those which I have taken.

The eggs are oval, some narrow and elongated, and others moderately broad or even slightly pyriform; the ground is white or slightly greyish white, and they are very thickly spotted and speckled all over, in some with reddish, in others with purplish brown and with pale inky purple. In some the markings are all very minute, speckly, and streaky; in others they are somewhat bolder and more spotty. Looked closely into in a good light, the tone of the markings varies a good deal, but not so much as do the eggs of our European *Anthus trivialis*. These eggs are almost entirely devoid of gloss.

I should add that in some eggs a ruddy purple tinge pervades all the markings, while in others the general tint is browner or greyer.

In length they vary from 0.82 to 0.98, and in breadth from 0.63 to 0.72; but the average of twenty-seven eggs is nearly 0.9 by 0.68.

Family ALAUDIDÆ.

Alsmon desertorum (Stanley). *The Desert-Lark.*

Certhilauda desertorum (Stanley), *Jerd. B. Ind.* ii, p. 438; *Hume, Cat.* no. 770.

Regarding the breeding of the Desert-Lark, Lieut. J. C. Francis, writing from Karachi, says:—"I discovered a nest of this bird yesterday (11th May), but unfortunately the young, three in number, were just hatched. I was looking for the eggs of the Small Terns, when I saw a Tern swoop down at another bird on the ground. I saw that the bird on the ground was a Desert-Lark, and on going closer I saw that it had a worm or small insect in its bill. I watched it, and saw it run up a mound of sand and stop there for a short time. On going up to this, I found the nest. The mound was just on the edge of a strip of bare sand; it was about 2 feet in circumference at the top, and 18 inches high, and roundish in shape. The nest was large, placed in the sand, from outside twig to outside about a foot across. It was composed of, first, a layer of small branches, and then a deep, circular cup, somewhat like an English Thrush's nest. The cup was composed of sand stuck together with bits of grass and two pieces of rag and lined with grass. Nest very conspicuous.

"I know the Desert-Lark perfectly, and have two specimens which I shot and skinned myself, so I did not shoot the birds. The old bird was very daring, running round and round my legs at a distance of less than five yards with outspread wings and open beak, but uttering no sound. I am certain of the bird—the shape of the beak, the spotted breast, the white on the wings, and its running powers and unwillingness to fly render it unmistakable. I watched a small colony of these birds, about six, a short time back, and found them constantly flying up perpendicularly to about 15 or 20 feet, and uttering a short, melodious, whistling song, the notes of which have quite gone out of my recollection."

Mr. Scrope Doig writes:—"On the 3rd June I found a nest and young of this species on a large open plain on the borders between the Narra and Hyderabad districts. Since then I have to thank my friend Mr. Finch for an egg of this bird taken at Jask. The nest I found was similar to those of *Pyrrhuloxia grisea*, but larger. The egg in my collection is in markings very similar to eggs of *P. melanarchus*, the markings being bolder and the egg about twice the size."

The eggs are moderately elongated ovals, slightly compressed towards one end, with a fine, compact, but scarcely appreciably glossy shell; the ground-colour is greyish white, in some thickly, in some thinly, freckled, speckled, or in some blotched, with pale yellowish brown. The markings have a tendency to form an irre-

gular zone about the large end, and in and about this zone are generally faint underlying clouds of very pale sepia or inky grey. In some eggs the markings are sparse and comparatively bold, in others very numerous and speckly and streaky in their character.

Two eggs measured 1.05 and 1 in length by 0.76 and 0.72 respectively in breadth*.

Otocorys elwesi, Blauf. *Elwes's Horned Lark*.

Otocoris penicillata (Gould), *Jerd. B. Ind.* ii, p. 429.

Otocorys penicillata (Gould), *Hume, Cat.* no. 763.

Mr. Mandelli sent me eggs obtained from a nest on the ground on the borders of Thibet and Native Sikhim, which he considered to belong to this species.

They are typical Lark's eggs, with a white or greyish-white ground, minutely freckled and mottled all over with a pale olive-brown, more or less intermingled with dull purplish grey. The eggs are somewhat elongated ovals, exhibit a slight gloss, and measure 0.88 and 0.9 by 0.64 and 0.65.

Alauda arvensis, Linn. *The Sky-Lark*.

Alauda triborhyncha, *Hodgs.*, *Jerd. B. Ind.* ii, p. 433.

Alauda arvensis, *Linn.*, *Hume, Rough Draft N. & E.* no. 766.

This, though certainly not *A. triborhyncha*, Hodgson, is the larger Sky-Lark which Dr. Jerdon describes under this latter name, and which, if distinct from the European bird, should stand as *A. liopus*, Hodgson. Mr. Brooks considers that it is specifically distinct; I do not. I therefore call it *A. arvensis*: he retains Hodgson's name. It makes very little difference, as with this explanation everybody will understand which bird I refer to.

The Sky-Lark (he would call it the "Larger Indian Sky-Lark") breeds, *I believe*, pretty well all through the Himalayas, at elevations of from 8000 to 10,000 feet, although I only *know* of its nests having been found in Kooloo and Cashmere.

In India as in England the oft-quoted lines subjoined well describe alike the nest and its situation:—

"He loves, where tufts of grass
Luxuriant crown the ridge; there, with his mate,
He founds their lowly house of withered bents
And coarsest spear-grass; next, the inner work
With finer and still finer fibres lays,
Rounding it curious with his speckled breast."

The only five nests of which I have records were found in May

* Mr. Hume appears to have examined numerous eggs of this species. Amongst his notes, however, I can find measurements of only two eggs. These were taken at Jask, in the Persian Gulf, on the 15th April, 1878. I cannot discover, however, any note regarding the finding of these or any other eggs.—Ed.

and June, and contained, one five, two four, and the rest lesser numbers of eggs.

Eggs which I consider belong to this species, though Mr. Brooks would assign them to *A. liopus* as a distinct species, taken at Soonamerg in Cashmere by Captain Cock, and in Kooloo by my own collectors, very much resemble those of *A. gulgula*, but are somewhat larger, and have the markings, I think, rather coarser.

The ground-colour of the egg is white, tinged greenish, yellowish, brownish, and greyish in different specimens, and the whole surface is thickly and moderately finely mottled over (much more densely towards the large end) with brown (the shade of which varies much in different eggs), generally more or less intermingled with dull grey. In some eggs the brown is decidedly yellowish; in others it is a sepia-brown; in some it is decidedly greyish. In most eggs the markings seem more or less completely confluent towards the large end, and form there a more or less irregular clouded cap or zone.

The eggs vary in length from 0.83 to 0.93, and in breadth from 0.65 to 0.67; but I have unfortunately only measured four.

Alauda gulgula, Frankl. *The Indian Sky-Lark*.

Alauda gulgula, Frankl., *Jerd. B. Ind.* ii, p. 434; *Hume, Rouga Draft N. & E.* no. 767.

Under this one specific title I propose to include all the many races of the Indian Sky-Lark, and there is the less inconvenience in this, that all these races, alike in hills and plains, north and south, breed at the same season (from the middle of April to nearly the end of June), build the same kind of nest, and lay the same number of precisely similar eggs.

The nest is always placed on the ground in a shallow depression, usually, I believe, scratched by the birds themselves, under the shelter of some clod of earth, large stone, tuft of grass or other herbage, or dense stunted bush. It consists merely of a deeper or shallower cup or saucer of fine grass, in many cases a mere lining to the hole or depression, in others a regular nest, the interior always being composed of the finest grass. Five is certainly the maximum number of eggs laid, and three is, I think, the usual complement.

From Almorah * Mr. Brooks tells us that he found the Indian Sky-Lark laying in Kumaon in May, and he says that the bird is "common on open ground near Almorah, and between that place and Binsur. It is a most delightful songster, quite equal to the English Sky-Lark, I think, and the song is sweeter. I do not think it goes on for quite so long a time as *A. arvensis*."

* A specimen of a Sky-Lark procured by Mr. Brooks at Almorah, and now in the British Museum appears to be referable to *A. gulgula* rather than to *A. arvensis* (var. *A. liopus*) as might have been expected.—Ed.

"The nest is placed in any little hollow more or less overgrown with short grass, and one I found with a stone partly overhanging it. It is composed, just like that of the English Sky-Lark, of a small quantity of fine grass. Number of eggs three or four, greyish white, mottled and speckled all over with two shades of light brown. The colouring closely resembles that of the eggs of *A. arvensis*."

From Saharunpoor Colonel G. F. L. Marshall writes:—"Our Sky-Lark builds a deep cup-shaped nest on the ground, against some clod of earth, composed of grass. It lays in the latter half of May, and five is the full number of the eggs."

Major C. T. Bingham says:—"I have only found nests of this bird at Allahabad, where it bred from the end of February to the end of April. Of eight nests found marked down for me, none contained more than three eggs."

"The nests are more or less deep saucers composed of fine grass-roots, very loosely put together, and placed nearly always under the shelter of a tuft of grass."

Colonel E. A. Butler writes:—"The Indian Sky-Lark is not particularly common. I found a nest near Deesa on the 8th July, containing two eggs, amongst some tussocks of coarse grass in the sandy bed of a river. The nest consisted of a well-woven pad of fine dry grass, placed in a hollow at the root of a small tuft of grass growing on bare shingle."

"Belgaum: 18th April, two fresh eggs; 19th April, two eggs slightly incubated. Both nests were built on the ground in small depressions by the side of a clod of earth, on a very open maidan, where the grass had been burnt away. I snared the hen birds at the nest, so that there should be no doubt as to identity. The nests were of the usual Lark-type—neat little cups of dry grass, coarse exteriorly, and fine within. Another nest, which I took on the 26th April, containing two incubated eggs, had a collection of small pieces of dried horse-dung in front of it, forming a slight embankment in front of the entrance."

"Belgaum: 17th September, 1879, found three fresh eggs. The nest consisted of a neat little cup sunk in a patch of short green grass on a grassy plain, upon which numerous herds of cattle were feeding. It was scantily lined with fine dry grass-stems, with a single lock (numbering about half a dozen hairs) of black horse-hair intertwined with the grass at the bottom of the nest. On trying to remove it, the whole affair fell to pieces in my hand. It was a difficult nest to find, being completely overgrown by the surrounding grass, with a small passage through the grass on one side for ingress and egress. To make sure of the species, although I had very little doubt, as the cock bird was soaring high overhead singing beautifully at the time, I laid a horsehair noose at the nest and caught the hen bird. I shot a young bird in the same neighbourhood, only just able to fly, in June, so that they lay also much earlier in the season."

Mr. B. Aitken writes:—"Akola, 20th July, 1876.—I found a

Sky-Lark's nest this morning with two young ones a week old. The nest, which was in a hole in a piece of broken ground, was cup-shaped, very deep, and neatly made of fine roots and straws; it had no lining. The old bird had just put an entire flying-ant, of large size, wing and all, into the bill of one of the young ones. Both the young were in a weak state, perhaps in consequence of the rainy weather, and the one in particular was making no effort to swallow its large and coarse mouthful, the wings of which, a full inch long, were sticking out of its bill.

"Akola, 10th August, 1876.—On the 2nd of this month I saw a Sky-Lark picking straws off the road and arranging them at the roots of a small babool bush, little more than a foot high. This was in the country, about two miles from the station. This morning I went to the place, and found the nest made and two eggs in it. The eggs were quite cold, but it does not follow from that that all the eggs had not been laid, as Sky-Larks do sometimes, after beginning to sit, leave their nests for upwards of an hour at a time.

"The shape of the nest was peculiar. There was not room at the root of the bush for a complete cup or circle to be formed; so the nest was placed half sideways, leaning up against the main stem of the bush. In order to suit this position the nest had been made nearly twice the usual size, and the part where the eggs lay, though properly the *side* of the entire structure, was as deep and evenly finished as the *bottom* of any other Sky-Lark's nest. The whole thing was of the shape that would be made by taking two thirds of one nest and half of another, the superfluous parts being cut off clean with a pair of shears, joining the edges so that the half part might stand upright upon the two-thirds part. I took some care to bring away the nest entire, but it was so loosely constructed, like all Sky-Larks' nests, that it fell to pieces as soon as it was taken out of its bed.

"The eggs are a little below the usual size, and are curiously coloured. They entirely want the dusky ground-colour usual in the eggs of this species. The ground-colour is pure white. The markings on one of them are exactly like those of the typical Sparrow's egg. The other egg is absurdly elongated at the thin end, and nearly all the spots are crowded together there. The shell of this egg is very thin. The peculiar smoothness, which is the most remarkable point about the Common Sky-Lark's eggs, is as observable on the white ground of these two eggs as on any of the usual dark colour."

Miss Cockburn says:—"In the Nilghiris the Indian Sky-Larks breed up to the summits of the highest mountains, as well as on their slopes and in the valleys.

"They build twice in a year, sometimes beginning as early as February, and continuing till May. Then again from August to October, and even later as I have noted, having found a young Lark on the 2nd November, 1858.

"They choose the open country, with sometimes a small low

bush here and there. The nest is placed on the ground slightly concealed from view by a low bush or small tuft of grass. I always fancy the birds scratch the round holes for themselves, as I have noticed a bare, smooth, round hole from which a pair of Larks had flown away, and some days after as neat a Lark's nest as possible occupied the same spot. The material they use is entirely fine grass, twisted round and round the hole, nearly half an inch thick. This fine grass is also placed, a little over the edge, on the side at which they enter. I never measured a nest, but think they were about $2\frac{1}{2}$ inches in diameter and 2 inches in depth.

"I do not remember *ever* having found a nest with more than three eggs or young ones, but have seen many with only two (occasionally) fully incubated eggs.

"Sky-Larks never lay twice in the same nest, but always build a new one for every brood. I think an egg is laid every two days.

"Both parents share the pleasure of building, hatching, and feeding the young. Even long after the latter leave the nest they are fed and watched by their parents, and return at evening, for a week or so, to sleep in the nest."

From Conoor (Nilghiris) Mr. Wait tells me that "the Sky-Lark lays in June. The nest is small and cup-shaped, composed of grass and fibres, and placed at the roots of small bushes or tufts of grass. They lay five eggs."

"For its nest in Ceylon," says Mr. Layard, "it selects some depression in the soil, which it lines with fine grass, and in it deposits from three to five eggs, of a brownish-grey colour profusely streaked and mottled. It breeds in April."

And Colonel Legge extends the breeding period in Ceylon up to August.

Dr. Jerdon states that "it breeds from March to June, making its nest of grass and hairs on the ground under a tuft of grass, laying three or four greenish-grey eggs, with numerous brown and dusky streaks and spots."

I have never seen eggs before the latter half of April, except from the Nilghiris, nor hair in the lining of any nest of this species. Both season and lining indicate *Galerita cristata*.

Mr. Oates, writing from Pegu, says:—"I found a nest of this bird with three eggs, nearly hatched, as early as the 28th December. It goes on breeding till April."

All the eggs that I have of this species from Northern India vary from moderately elongated to moderately broad ovals, at times a good deal pointed towards the small end, and fairly glossy. The ground-colour in some is greyish-, in others yellowish-, white, and all are densely speckled, spotted, freckled, and even blotched with pale yellowish and purplish brown or very pale inky purple.

Eggs of this species sent me from the Nilghiris by Miss Cookburn and others exactly resemble those of the northern races. They are moderately elongated, very perfect, ovals, and belong mostly to two types of colouring—the one has a cream-coloured

ground, and is speckled and freckled excessively finely all over with tiny specks and spots of dull, pale, purplish grey and very pale brownish yellow; in the other type the ground is nearly pure white, and the markings, though similar in colour to those of the other type, are darker in shade, larger, and much less densely set.

Eggs of these types present very different appearances according as the markings are coarser and finer, and as the purplish-grey or brownish-yellow predominates. One specimen, which appears abnormally coloured, has a dull white ground, speckled and clouded, almost exclusively towards the large end, with pale slaty grey. Most of the eggs are more or less glossy; some have a very fair amount of gloss.

In length the eggs vary from 0.74 to 0.88, and in breadth from 0.56 to 0.66; but the average is 0.6 by 0.61.

Alaudula raytal* (Buch. Ham.). *The Ganges Sand-Lark.

Alaudula raytal (Buch. Ham.), *Jerd. B. Ind* ii, p. 428.

Alaudula raytal (Blyth), *Hume, Rough Draft N. & E* no. 762.

The Ganges Sand-Lark breeds along the sandy dunes that fringe this great river and its innumerable affluents, and in similar situations along the Brahmapootra, the Irrawaddy, and the Nerbudda. In the upper portions of the courses of these rivers, to judge from those we know, it is not found, and again when they approach the sea it, I believe, disappears. A broad and tranquil stream, with wide bare banks of sand, is what it loves, and there amid a few stunted straggling shoots of tamarisk it breeds and may be seen at all seasons.

It lays, so far as my limited experience goes, in March, April, and May, making a tiny circular nest in some little hollow, under a tuft of grass or tamarisk, or beside and partly under a stranded log, the fragments of some old boat, or a large stone.

The nests are very small, some 3 inches in diameter, pads with slight central depressions or shallow saucer-like affairs, composed of fine grass or dry tamarisk leaflets.

Two, I believe, is the normal number of eggs, but one nest that was sent me contained three.

As regards its nesting on the Nerbudda, which could hardly have been looked for, I may note that Mr. Nunn took two nests, both apparently belonging to this bird, early in May at Hoshungabad. Of one he sent the parent bird, and there can therefore be no doubt as to the one nest, though further observations are necessary, as no one else has recorded the bird from the Nerbudda. Both nests were tiny saucer-like fabrics, composed of fine grass and only about 2.5 in diameter. The one taken on the 1st May was placed at the foot of a tuft of coarse grass on the level ground just above a nullah. The other, taken on the 6th May, was alongside a large stone in the dry sand of the bed of the Nerbudda. Each nest contained a single fresh egg.

Mr. J. R. Cripps, writing from Furreedpore, in Eastern Bengal.

says:—"Common on the large sandy churs of all the big rivers; how the bird exists on the bare white sand during the heat of the day is a wonder. I found a nest on a chur on the 9th April. The rain-water trickling over a low bank had formed a small hollow, which was overhung by a ledge of earth; in this hollow was a nest composed of fine grasses with a few feathers stuck about it; the nest was a deep cup and measured externally three inches diameter and two inches deep; inside two inches broad, and one inch deep; there were two fresh eggs. I came back next day and found another egg had been laid. I brought the nest, &c. away for fear of the eggs being eaten by any bird, so am unable to say if they lay more than that number of eggs."

The eggs closely resemble those of *Pyrrhuloxia grisea*. It may be a mere accident, but the specimens I have are less glossy than any egg that I possess of that species, and their markings are finer and more speckly. They are rather elongated, nearly perfect, ovals, only slightly compressed towards one end. The ground-colour is greyish or yellowish white, and they are *excessively* minutely speckled all over with yellowish brown, a few very faint inky-purple specks being in one egg intermingled.

The eggs vary from 0.71 to 0.79 in length, and from 0.52 to 0.58 in breadth; but I have too few unfortunately to enable me to strike any useful average.

Alaudula adamsi* (Hume). *The Indus Sand-Lark.

Alaudula adamsi (Hume), *Hume, Rough Draft N. & E.* no. 762 ter.

The Indus Sand-Lark represents the preceding species on the great river of Sindh and all its affluents in the plains of the Punjab.

It breeds in March, April, and May, but I have never found a nest.

Captain Cock, as far as I know, was the first person who took the eggs of this species.

He says:—"Your little Sand-Lark breeds in the sandy islands on the Jheelum during April and May. The nest is usually placed on the north side of, and at the roots of, a small tamarisk bush; it is a little depression in the soil, lined with fine grass loosely put in, and contains two to three eggs, usually the former number."

Colonel E. A. Butler writes:—"At Kurrachee, 24th April, 1877, I found a nest containing two fresh eggs. The eggs, which are very large for the size of the bird, are whitish, freely speckled, spotted, and blotched with olivaceous brown with occasional ink-slate markings also. The nest, which is very similar to, but rather smaller than, the nest of *Galerita cristata*, consists of a hollow in the ground, lined substantially with dry grass, lumps of raw cotton, and a few horsehairs, small pieces of rag, thread, and a few old feathers incorporated, and often slightly banked round with thin pieces of hard incrustated earth. It is usually situated either

in, or else under cover of, one of the small scrubby salt-plants (*Salsola* sp.) so common on the bare sandy plains of Kurrachee. Some eggs are much less marked than others, and some have a well-defined zone at the large end.

"I found other nests later on on the following dates:—

"April 29th. 11 nests each containing 2 fresh eggs.

" 29th. 1 nest containing 3 fresh eggs.

" 29th. 1 " " 1 chick fully fledged.

" 30th. 1 " " 2 fresh eggs.

" May 5th. 1 " " 3 fresh eggs."

An egg of this species obtained on the banks of the Jheelum on the 20th March much resembles those of the preceding species, but it is more glossy, the ground-colour is somewhat purer white than either, and it is less densely spotted and speckled, the markings being spots and specks and small smears of pale yellowish brown, with a few very minute pale inky-purple specks and spots underlying the brown markings.

Generally I may add, after seeing several more eggs, the ground-colour is dull white, spotted and mottled all over, but more thickly towards the larger end, with pale greenish brown. There are a few spots of grey intermixed with the brown ones, especially towards the larger end.

Several eggs that I measured varied from 0·7 to 0·8 in length, and from 0·5 to 0·57 in breadth.

Mirafra cantillans, Jerd. *The Singing Bush-Lark.*

Mirafra cantillans, Jerd., Jerd. B. Ind. ii, p 420; Hume, Rough Draft N. & E. no. 757.

The Singing Bush-Lark, as Jerdon calls it, breeds in many places in the North-western and Central Provinces and the Punjab. The bird has always been a puzzle to me. At distances of 50 miles or more apart you come upon small colonies, while in hundreds of intermediate and apparently precisely similar localities you never see it. I have had its eggs sent me from near Lahore and from Hansie, have found them in Goorgaon and in the south of the Cawnpoor District, and again have received them from Jhansi.

The breeding-season lasts from March to August. The nest, like that of *M. assamica*, is sometimes a mere pad, sometimes a domed nest, composed of rather fine dry grass and roots, and sometimes slightly lined with finer grass or roots, but usually without any pretence for a lining. It is placed mostly amongst thick grass and is well concealed; but at times in little frequented localities, such as the ravines of the Jumna on the south of the Cawnpoor District, it will be found in a slight depression of the soil or niche in a bank quite open to view.

Four is the largest number of eggs I have ever found in one nest.

From Hansie Mr. W. Blewitt wrote one year:—"I secured one nest of this species in the Dhana Beerh, or jungle preserve, near

Hansie in July. I shot the parent bird at the time and sent with the eggs. The nest was formed of fine grass, almost meeting above and with a hole at the side for ingress and egress, and, though much smaller, reminding one of a Munia's nest. It was placed on the ground in a tuft of coarse grass at the root of the tuft, and contained three fresh eggs.

"This bird is very common in this preserve. I shot, if I remember right, more than a dozen specimens there in one morning; but it so carefully conceals its nest, that, though constantly searching for it, I only succeeded in securing this single nest."

Next year he was more successful, and again wrote, saying:—"This species breeds, I found, plentifully in the Dhana Beerh, near Hansie, in March and the early part of April, laying its eggs in a slight depression in the ground in amongst tall grass. It usually lays four eggs, but on the 28th March I found a nest containing seven fresh eggs; whether these belonged to one or more couples, or whether some herd-boy had collected the eggs of two or three nests into one, I cannot say, but certainly one bird was sitting on them all when we found the nest."

I think all these *Mirafra*s have two broods in the year, and I suspect that it is for the second brood, when rain is to be apprehended, that the bird most often domes its nest.

Colonel E. A. Butler writes from Deesa:—"The Singing Bush-Lark breeds in the neighbourhood of Deesa during the rains. The nest as a rule is placed under a tuft of grass, and is almost spherical, with a hole near the top for ingress and egress; it consists of dry grass somewhat massively put together and neatly lined with similar material of a finer quality. The following are some of the dates upon which I have taken nests:—

" July 22nd, 1875. A nest containing 3 fresh eggs.					
"	16th, 1876.	"	"	3	"
"	16th, "	"	"	3	"
"	28th, "	"	"	3	"
Aug.	5th, "	"	"	3	incubated eggs.
"	9th, "	"	"	4	fresh eggs.
"	10th, "	"	"	2	"
"	15th, "	"	"	4	"
Sept.	2nd, "	"	"	4	incubated eggs.
"	2nd, "	"	"	3	fresh eggs.
"	2nd, "	"	"	3	"

"The hen bird generally sits very close; in fact I have taken them on the nest on more than one occasion, with a horsehair noose fastened to the end of a thin rod."

From Lahore Colonel Marshall writes:—"In June I found a nest of this species in the side of a little bank, about 6 inches above the level of the plain. It was a poor, badly made thing: there was a little hollow in the earth, and in this was placed a small makeshift sort of nest of grass-fibre lined with a little finer material. Three fresh eggs."

The eggs closely resemble, as a rule, those of the other species

of *Mirafra*, though some specimens are more streaky and less speckly in their markings, reminding one of some types of our Common Sparrow's eggs. The ground-colour is greyish-, greenish-, or yellowish-white, and some eggs are thickly speckled, spotted, and streaked, and others are uniformly and very densely freckled with different shades of yellowish and sepia-brown, with here and there in the spotted types tiny, very pale inky-purple clouds underlying the brown markings. In shape and size they seem to vary more than those of the other species. The shape is normally, I think, a rather long oval, moderately pointed towards the small end, but short, pyriform, and regular broad oval forms seem not uncommon. They have a faint gloss.

They vary in length from 0.72 to 0.9, and in breadth from 0.58 to 0.65.

***Mirafra assamica*, McClell. *The Bengal Bush-Lark*.**

Mirafra assamica, McClell., *Jerd. B. Ind.* ii, p. 410; *Hume, Rough Draft N. & E.* no. 754.

Dr. Jerdon tells us that "the Bengal Bush-Lark is found throughout all Northern India to the Nerbudda, extending eastwards into Assam." This appears to me to convey a somewhat erroneous conception of the bird's habitat; it is found *nowhere* in Northern India, except in the comparatively humid districts that fringe the skirts of the Himalayas east of the Jumna. From the greater portions of Oudh and the North-west and the Central Provinces, from the whole of the Punjab and Rajpootana, it is, according to my experience, entirely wanting. Throughout Lower and Eastern Bengal, in the better-watered and wooded tracts of the Central Provinces and Chota Nagpore, in Assam and Cachar, and in the Dhoons, Terais, and Bhaburs that lie at the foot of the Himalayas, and the immediately adjacent districts of Behar, Oudh, and the North-western Provinces, it is a permanent resident.

It lays from the middle of May to the middle of June, constructing on the ground, generally in some hollow, concealed and overhung by tufts of grass, a loose and usually partially domed circular nest, composed of fine dry grass and grass-roots. Sometimes the nest is a mere pad of grass, perhaps 4 inches in diameter and an inch in thickness, with a slight central depression. More commonly it is wholly or entirely domed over, sometimes with the entrance at the top, and sometimes at the side, never very compact in structure, often so loose that you can see the eggs through the straggling roof. I once found a nest entirely under a large clod of earth, which completely overhung and concealed it; in this case the almost invariable grass-tuft was absent. The largest and most perfect nest I ever saw was rather more than a hemisphere, the curved surface uppermost, 7 inches in diameter and 5 inches high, and with a neatly made circular aperture 2 inches in diameter nearly at the top. More roots had been used in this than is customary, and these had been specially used internally, at the bottom,

as if to form a lining, but as a rule there is no pretence for this latter. Most nests are loose, flimsy things that will not bear removal.

Five is the usual complement of eggs, but four, three, and even two, hard-set eggs or young are often found.

From Saharunpoor Colonel G. F. L. Marshall writes:—"Builds in the first half of June a nest of grass and roots roofed over and placed against a tuft of grass on the ground. The bird is common in the north of the Saharunpoor District, but the nest is very difficult to find. On 7th June I found a nest with one fresh egg and one addled, on the 19th June one with three fresh eggs, and on the 30th June one with five fresh eggs. The nest has a side entrance, is very loosely put together, and has no lining."

Dr. Jerdon says:—"One (nest) which I obtained in Dacca in June was distinctly domed or covered in by turning the stems of grass over, and was very artfully concealed. The eggs are dull greenish white, with numerous grey and brown spots."

Mr. J. R. Cripps, writing from Furreedpore in Eastern Bengal, says:—"Very common and a permanent resident; found in open plains and cultivated fields, and also on the public roads. I have repeatedly found their eggs. On the 23rd March a female flew past me with a straw in her bill and settled in the dry bed of a tank. On my going up to the spot she flew off the nest and was shot. The nest, the lower half of which rested in a small hollow, was a domed structure of 'sone' and 'doob' grass-roots with a lining of very fine roots of those grasses; there were also some lumps of matted fur like that of the rat in the nest; the entrance was at the side; there were two fresh eggs; the whole thing was very artfully concealed. I found another nest in an indigo field, which was partially overhung by a tuft of grass, but which was only a pad of grass-roots and contained four fresh eggs. I shot the female as she flew off. This was on the 22nd June; the breeding time is from the beginning of March to the 15th July."

The eggs taken by Mr. Cripps are moderately broad ovals, pointed towards the small end. The shell is fine, though slender, and has a slight gloss; the ground-colour is white, but with a faint greyish or greenish tinge. Round the large end is a more or less irregular but conspicuous zone densely set with specks and spots almost black, but browner in some specimens, and little clouds and smears of inky grey, and similar markings, though much less dense elsewhere, are scattered over the rest of the surface of the egg.

Generally speaking, the eggs of this species closely resemble those of *M. erythroptera*, but as a body are larger. They are characteristic Lark eggs, with greyish or yellowish-white or stone-coloured grounds, very thickly freckled and spotted, and sometimes finely streaked, with yellowish or pale purplish brown. The markings are commonly somewhat more dense at the large end. In shape the eggs are slightly elongated ovals, but little pointed towards the small end. They have, as usual, a faint gloss.

Sometimes the markings are all very fine and speckly; and are, the one set a blackish brown, the other pale purplish grey.

In length the eggs vary from 0.79 to 0.92, and in breadth from 0.57 to 0.65; but the average of twenty-six eggs measured is 0.83 by 0.61*.

Mirafra erythroptera, Jerd. *The Red-winged Bush-Lark.*

Mirafra erythroptera, Jerd., Jerd. B. Ind. ii, p. 418; Hume, Rough Draft N. & E. no. 750.

Dr. Jerdon tells us that "the Red-winged Bush-Lark is found in the tableland of the Deccan, extending south to the edges of the Carnatic, and it is found also in the hilly district of Monghyr;" but he did not observe it in Saugor or Mhow.

Now, this again conveys a scarcely correct notion of the distribution of this species. *This, and not M. assamica, is the Bush-Lark par excellence of Northern India.* Throughout the Central Provinces, the North-western Provinces, the Punjab and Rajpootana (except at the extreme west), and the drier portions of Oudh, this Lark abounds, and is perhaps the commonest resident Lark throughout this vast tract, as a whole. It breeds from March to August. The nest is never (so far as I know, and I have seen fifty) anything more than a smaller or larger pad of finer and coarser grass, in which at times a little vegetable fibre is intermixed, with a slight central depression. The situation chosen for the nest varies. I have found them in a hoof-print, in a perfectly bare plain, in an equally bare field under clods of earth, in open country at the foot of some dense tuft of grass, in scattered jungle, at the base of caper-bushes, or even young babool or neem trees, and in amongst grass. Later, when the rains have set in, heaps of kunker by the roadside or heaps of ballast beside the railway are often selected; and Mr. Brooks tells me that on one occasion he found a nest containing the full complement of partially-incubated eggs amongst the ballast *between* the rails and almost under one of them, so placed that trains were perpetually passing over the birds, the rim of the wheels passing within 2 or 3 inches of her head.

Four is, I think, the regular complement of eggs; but I have often found three hard-set, and once or twice five fresh ones.

Major C. T. Bingham writes:—"Although this bird is common enough at Delhi, I have not procured many nests of it. Personally I have only found one, but three others were marked down for me and I took them with my own hands. The one I found was on the 21st September, while walking on the ridge. I saw one of these Larks with a straw in its beak, and watched it to the nest, where I found the female sitting on two fresh eggs; as she flew off I shot her. The nest was a soft pad of very fine grass, placed, like all Larks' nests I have found, on the north side of a stone.

* I found, however, from Mr. Hume's detail measurement-sheet, that one of the eggs here measured was 0.9 by 0.65, a perfect monster, unduly raising the average.—Ed.

Unlike the three other nests got earlier in the year, the present nest was domed beautifully over with the same material as the nest.

"The three nests referred to above I procured as follows :—One on the 5th April containing three slightly set eggs; two on the 17th May containing, one two hard-set, and the other one fresh egg."

Colonel E. A. Butler says :—"The Red-winged Bush-Lark breeds in the neighbourhood of Deesa from March till August or September. I have found nests on the following dates (1876) :—

"April 29th.	A nest containing	3 fresh eggs.
"May 7th.	" "	2 half-fledged young birds.
"July 20th.	" "	3 fresh eggs.
"July 29th.	" "	3 young birds.
"Aug. 18th.	" "	1 incubated egg.
"July 25th.	" "	3 young birds.
"July 31st.	" "	1 addled egg, 1 young bird.

"The nest as a rule is dome-shaped, and placed under a tussock of grass, exactly similar to the nest of *M. cantillans*; but in some instances it consists of a pad of fine dry grass placed on open ground, in a hole scratched by the old birds. The eggs as a rule are greyish white, thickly speckled and marked all over with greyish brown, sparingly underlaid with inky purple, most densely towards the large end. One nest which I found was placed under a low bush, and was so cleverly concealed that had I not watched the old bird with food for the young ones in her mouth, I should never have found it. It looked more like the nest of a field-mouse than that of a bird. The entrance was not visible from above, and it was only by lowering my head almost to the ground that I could see into it."

The eggs are typically nearly perfect ovals, neither very broad nor very long, and but little pointed or compressed towards the smaller end; indeed some of the eggs can scarcely be said to have a smaller end. They vary less, I think, in size and shape than those of any of the other species of this genus, but in colour they differ more. The ground-colour, which harmonizes with the general colour of the markings, ranges through greenish-, greyish-, pinkish-, yellowish-, and brownish-white, in some the tint being very faint, in others fairly well marked. They are invariably more or less finely speckled and spotted all over, more hazily and confluent in some, more clearly and defined in others. The colour of the specks and spots varies in different eggs from red, brownish red, and inky purple, to reddish-, yellowish-, and olive-brown, the markings of each egg being commonly unicolorous; and while in some the markings are fairly bright and deep, in others they are very faint and feeble. The uniform speckly character of the markings is typical in this species, but in a few eggs the great density of the spots towards the large end renders them more or less confluent there, and produces very imperfect and irregular zones or caps. All the eggs have a little gloss, but some have a good deal more than others.

In length they vary from 0·7 to 0·82, and in breadth from 0·55 to 0·65; but the average of twenty-nine eggs is 0·76 by 0·59.

Mirafra affinis, Jerd. *The Madras Bush-Lark.*

Mirafra affinis, Jerd.; *Jerd. B. Ind.* ii, p. 614; *Hume, Rough Draft N. & E.* no. 755.

I have never found the nest of the Madras Bush-Lark. Dr. Jerdon states that "it breeds on the ground, making a loose nest of grass, and lays three or four eggs, greenish grey, with spots and stains of brown and dusky."

Colonel Tickell remarks:—"Nest ordinary, of grasses, 4 inches in diameter, placed on the ground under shelter of clods, tufts of grass, &c., in fallow fields or open patches in jungles. Eggs, three or four, ordinary, rather lengthened, 0·81 by 0·56; dirty ashy white, with stains, smudges, and specks of dusky, ashy, and rusty brown."

Colonel Legge, writing of Ceylon, remarks:—"In the Western Province, the Bush-Lark breeds in May and June, and in the north somewhat earlier, commencing about March."

Mirafra microptera, Hume. *The Burmese Bush-Lark.*

Mirafra microptera, Hume; *Hume, Rough Draft N. & E.* no. 755 bis.

This is the Burmese Bush-Lark which I characterized in 'Stray Feathers,' vol. i. p. 483.

Mr. Oates tells us:—"I found the nest on the 25th July at Boulay, near Thayetmyo, with two eggs and one young bird just hatched. It was on the ground in a hoof-mark, protected and concealed by grass, slightly domed, composed entirely of fine grass and fibres.

"I have now only one egg. This measures 0·83 by 0·6. The ground-colour is white. The whole egg is thickly spotted with rusty brown and dark brown spots, very thickly at the larger end, where they form a distinct ring."

Galerita cristata (Linn.). *The Crested Lark.*

Galerita cristata (Linn.), *Jerd. B. Ind.* ii, p. 436; *Hume, Rough Draft N. & E.* no. 760.

The great majority of those vast multitudes of Crested Larks that during the cold season meet us on every bare plain and every stubble-field, throughout the drier and better-cultivated portions of Continental India at any rate, are, I am convinced, migratory. A certain number, however, unquestionably remain to breed. I have taken the eggs at Etawah, Bareilly, and Ferozepoor, I have had them sent from Saharunpoor and Lahore, and I know of the birds breeding in the Salt Range and about the Sambhur Lake.

The breeding-season lasts from March to June. They build on the ground like other Larks, and in very similar situations, that is to say in hollows or depressions under the cover of some bush,

tuft of grass, clod of earth, or overhanging stone. The nest varies from a shallow pad 4 or 5 inches in diameter, with a slight central depression as an egg-cavity, to a neatish and regular cup, with a fully hemispherical cavity. Exteriorly the nest is always composed of more or less fine grass, just like those of all the preceding species, but unlike theirs the nests have generally a more or less regular lining of very fine grass, cotton, wool, soft vegetable fibres, hair, and even a few feathers. I think that, *as a rule*, the nests of this species may be distinguished at a glance by the lining from those of all our other Larks with which their eggs could be confounded. Three is the largest number of eggs that I have found as yet in any nest, but others report five.

Colonel G. F. J. Marshall sent me the following note on the nidification of this species. He says :—"The Crested Lark, to judge from the two or three nests I have seen, breeds in March in the Saharunpoor District, the young being hatched early in April.

"The nest is placed on the ground in a slight hollow beside a tuft of grass or a small *bēr* bush. I found one nest in the middle of a village-cart track near a low bush, between the wheel-tracks. The nest is cup-shaped, formed by lining a hollow in the earth with grass, roots, fibre, and little bits of straws, dry wheat-leaves, and stringy bark, neatly put together, so that the sides are level with the ground. There is no perceptible lining. The size of the egg-receptacle is about 2½ inches in diameter and 2 inches deep, but the material did not hold together sufficiently well to retain the shape after it had been taken out of the ground.

"The eggs, three in number, were slightly glossy, of a white ground, profusely speckled, spotted, and blotched with various shades of yellowish and pale purplish brown. In one the specklings were so close all over the egg as almost to conceal the ground-colour, and in all the markings are much thickest at the large end, where they have a tendency to form a nearly confluent cap."

Major C. T. Bingham writes :—"I have only found two nests of this Lark, and both at Delhi, one on the 31st March and the second on the 23rd April. The former, which was a deep cup, was placed under the shade of a bush, in a deepish hole which I am inclined to think the bird itself dug. It was composed of straw without any lining. The latter nest was placed in the centre of a clump of surpat grass, and was composed of the same materials. Two fresh eggs were in the first nest, and four hard-set ones in the second."

From Sambhur Mr. R. M. Adam writes :—"The Crested Lark is very common. It breeds about April and May. On the 29th April I saw a nest all but finished in a wheat-field. In young birds the head and wing-coverts are spotted with dusky white."

Mr. W. Theobald makes the following note on the nidification of this bird in the neighbourhood of Pind Dadan Khan and Ketas in the Salt Range :—"Lay from the fourth week of March to the 3rd May : eggs four ; shape ovato-pyriform, measuring from 0.82 to 0.88 in length, and from 0.64 to 0.66 in breadth ; colour yel-

lowish white, uniformly freckled with greyish yellow and neutral. Nest a little grass in a hole in the ground."

Colonel Butler has sent me the following note from Sind:—
 "At Kurrachee, 22nd April, 1877, I found a nest containing one fresh egg. The nest was on the ground in the centre of a small scrubby salt-plant, common all over the sandy maidans about Kurrachee. It was composed of coarse dry grass, roots, &c., and lined with lumps of raw cotton, bits of rag, thread, &c., the exterior being encircled with a slight embankment of lumps of hard incrustated earth which had peeled from the surface of the ground that had been inundated.

"In the same neighbourhood I found nests later on, on the following dates:—

"April 29. 2 nests, each containing 1 fresh egg.

"April 29. 1 nest containing 2 fresh eggs.

"April 30. 1 " 3 chicks fully fledged.

"April 30. 1 " 1 fresh egg.

"May 1. 1 " 2 fresh eggs.

"May 1. 1 " 3 half-grown young birds.

"May 5. 1 " 3 eggs (1 fresh and 2 incubated).

"The eggs vary so much in shape and markings that I have scarcely two alike. The ground-colour seems generally, however, to be a pale greenish white. Some eggs are boldly blotched, spotted, and speckled with dark olive-brown, with a few inky-purple secondary markings. Others are speckled all over with greenish olive and inky purple. Others are boldly spotted and speckled, principally at the large end, with olive-green, without any secondary markings, and in some instances there is a decided tendency to a zone. In some eggs the markings are clear and well defined, in others they are faint and indistinct. In shape and size they also vary greatly. It is a wonder to me how any of the eggs of this species are ever hatched, as out of many dozens of nests of both species which I left this year with single eggs in them to take later on, I found invariably on returning a day or two after that the nests were empty. What it is that takes the eggs I do not know (possibly foxes, as I saw their 'pugs'), but whatever animal it is it must be an uncommonly clever nest-seeker as hardly an egg seems to escape notice."

The eggs are broad ovals, typically a good deal pointed towards the small end, and they have a little but not much gloss. "Our Indian eggs, I must remark, are very much smaller than those of European birds to judge from Mr. Hewitson's figure. I have taken a good many eggs of this species, and they averaged little, if anything, bigger than Mr. Hewitson's figure of the egg of *O. brachydactyla*. They have a strong family resemblance to the various Lark eggs already described, but they are of course larger than most of them. The markings, too, as a whole are larger and more conspicuous. The ground-colour as usual is a greenish or yellowish white, and the markings, specks, spots, and blotches are yellowish or greenish brown and pale purple, all three colours of

markings being often met with in the same egg. Here and there an egg is found with a pretty conspicuous zone of more or less confluent markings.

In length they vary from 0·85 to 0·92, and in breadth from 0·65 to 0·69; but the average of seventeen eggs is 0·87 by 0·65.

Galerita deva (Sykes). *Sykes's Crested Lark.*

Spizalauda deva (Sykes), *Jerd. B. Ind.* ii, p. 432; *Hume, Cat.* no. 765.

Spizalauda simillima (Hume), *Hume, Rough Draft N. & E.* no. 765 bis.

Sykes's Crested Lark breeds in suitable localities, viz., dry, open, more or less cultivated lands throughout a considerable portion of Central and Southern India.

The breeding-season lasts from June to August, but the great majority of the numerous eggs I have from Lahore, Etawah, Jhansi, and Saugor were obtained on various dates in August.

They build on the ground in dry, open, thoroughly drained country, always placing the nest in more or less of a depression in the soil, and often concealing it entirely behind an overhanging clod, or at the roots of a thick bush, or within a dense clump of grass.

The nests of this species which I have seen have all been small, rather oblong, shallow cups, measuring externally about 3 inches to 4·5 in diameter, and 1·5 to 2·25 in height, rather compactly and densely put together with coarse vegetable fibre and by no means fine grass. The egg-cavity, which had no lining, measured from 2 to 3 inches in diameter, and was from an inch to 1½ inch in depth.

From Jhansi and Saugor, where he obtained numerous nests, Mr. F. B. Blewitt writes:—Sykes's Crested Lark breeds from the middle of June to August. A grass patch is generally selected for the nest, sometimes a close-growing bush, at the base of which the nest is made. The nest is always made on the ground, and, as far as possible, well secreted in the patch or bush *under* which it is sheltered. The nest at the base is made of coarse roots and grass to about an inch or 1½ inch in thickness. On the upper surface of this is placed grass of a finer texture, with occasionally khus intermixed. The centre of the nest is a hollow of from 1½ inch to an inch in depth. The grass of the nest is closely put together, forming on the whole a compact structure. The diameter averages about 5 inches.

"The eggs are white, with minute ashy-looking spots, sometimes of lightish brown, all over, thicker towards the broad end.

"The average length is about 0·8 and breadth 0·6. Three are the regular number of eggs, though two are frequently found."

In this latter remark I quite concur. Out of six nests found and taken by myself one contained three, and two, two eggs each,

all fresh; one contained two hard-set eggs and two, two young ones. In my opinion three is the maximum number.

It is probable that these birds have a second brood in February or March, just as their southern ally has, but I have had no evidence of this.

The eggs of this species appear to me to be more variable than those of any other Lark, and they are also more glossy than those of the majority of the species of this family. The shape I take to be typically a rather short broad oval, a good deal pointed at times towards the smaller end. Eggs taken even out of the same nest vary greatly in size. Some eggs have a clear greenish-white ground, and are richly and thickly spotted and speckled, but most denser, at the large end, with rich roddish and orange-brown, intermingled with tiny faint inky-purple clouds. In this type of egg the markings are clear and well defined, reminding one of some types of *Thamnobia sambaiensis*. The majority of the eggs, however, have a creamy-yellow ground, and are thickly and very finely freckled and crowded all over with faint inky-purple and yellowish brown, the markings everywhere ill-defined and all but confluent. Other eggs have a greyish or yellowish-white ground, and are streaked and spotted, or clouded and speckled, with greyish-, earthy-, or olive-brown, as the case may be.

The eggs vary from 0.73 to 0.86 in length, and from 0.55 to 0.65 in breadth; but the average of thirty-nine eggs is 0.77 by 0.6.

***Galerita malabarica* (Scop.).** *The Malabar Crested Lark.*

Spizalauda malabarica (Scop.), *Hume, Rough Draft N. & E* n. 765; *Cat. no. 705 bis.*

This present species ascends the Nilghiris to heights of 4000 and 5000 feet at any rate, and there on the 8th April Miss Cockburn found a nest which she sent me, containing three eggs. The nest was a tolerably compact but shallow saucer, composed of grass and fibres and lined with fine roots, placed on the ground under some overhanging tufts of grass. She has also sent me the following interesting note on the habits and nidification of this species. She says:—

"This bird differs from the Sky-Lark (*Alauda gulgula*) in never singing while on the wing. He sits on a stone or the stump of a dead tree while performing his part in the general concert, which in the breeding-season is heard on every side. With drooping wings and tail erect he continues turning round and strutting about until his song comes to a close, which it seldom does before he has imitated the peculiar song or call of every bird and beast that may come within reach of his most wonderful ear.

"His power of mimicry is quite astonishing. A pair of these birds once built their nest in a strawberry-bed in our garden. The young ones were taken when fully fledged and I reared them. When I could distinguish the cock by his attempts to sing I gave

the man her liberty. The cock I kept caged, and when three years of age he had attained to such a proficiency that, while sitting in my room as he hung outside the window, I could imagine the Nilghiri Robin within a yard of the window, the Common House-Sparrow actually on the window-seat, the Black-headed Tit-mouse on one of the flowering plants close by, the Kite just flying over, the Hill Mynah on a large tree at a short distance, the Yellow Wagtail just taking flight, and innumerable others, all close at hand, all the notes being sung in rapid succession, and amongst them occasionally would be the neighing of a horse introduced, so correctly imitated that some who heard it have doubted that it could be the bird till they had looked in vain for the animal.

"On the Nilghiris the Crown-crest generally builds, first in the months of March and April, and again in August and September. They always construct their nest on the ground and beneath a tuft of grass. They scratch a shallow round hole on the surface of the ground, and lining it very neatly with fine grass seldom lay more than two eggs, though I have occasionally found three in their nests. Their ground-colour is a light yellowish brown with a profusion of dark spots, particularly at the thickest end."

Colonel E. A. Butler writes:—"Belgaum, 14th June, 1879. A nest on the ground on the Rifle-ranges, consisting of a round deep cup well sunk in the ground, and neatly and compactly built of fine dry grass with two or three blades of the surrounding grass growing over it, which partially concealed the contents. It was in a very exposed situation, being actually on the Range between the firing-point and the target, and all of the bullets, when the men were firing, must have passed close over the head of the bird when sitting. The grass was only a few inches high at the time, and consequently afforded very little cover. The eggs, three in number and quite fresh, were greyish white, thickly speckled with yellowish brown, greyish brown, and leaden blue, forming a dense cap or zone at the large end."

He adds:—"Mr. Davidson has sent me two eggs taken at Sholapore in the Deccan, on the 15th and 30th August, 1877, respectively."

Mr. G. Vidal, C.S., writes from Ratnagiri:—"This Southern Crested Lark breeds at Ratnagiri in October and November, after the heavy rains have ceased. There is a rugged laterite plateau of considerable extent to the east of the station, where this species is plentiful for the greater part of the year; this tableland is entirely bare, and appears as a huge sheet of flat rock, the laterite cropping to the surface everywhere. During the S.W. monsoon, however, rank grass sprouts up wherever the crumbling surface affords a hold for the roots—lilies, hardy creepers, and ferns shoot up from the fissures in the rocks, and here and there coarse hill-grains are sown in the least unpromising patches of ground. The Crown-crests as a rule affect no concealment in their choice of a site. A slight hollow in the bare ground or hard rock, either

natural or artificially scraped out by the birds themselves, is filled in with grass of two kinds, a coarse quality for the outside, and a finer for the inside. No other material is used, and the grass is somewhat loosely put together. In shape the nests are rather shallow cups, with an internal diameter of about $2\frac{1}{2}$ inches. Nests formed on the bare ground are fully exposed to view on three sides, but are *invariably* shaded or sheltered on the remaining side by a stone or chip of rock, which is sometimes more, but never less, than double the height of the nest from the ground. The only Crown-crests' nest I have found without this flanking stone was placed under cover of thin grass. There is one distinction between all the nests of the Crown-crested Larks and the Finch-Lark (Both of which species breed at the same time with us) that I have observed, and that is, that while the Crown-crest's nest is always placed in a *depression* of the ground, the Finch-Lark's nest always rests on the level surface. The latter certainly scrapes up all round its nest a tiny embankment or rampart of loose stones and crumbings of rock, but never makes or chooses any ready made hollow or depression. I am aware that this distinction does not hold good in other localities, but all the nests I have found of *P. grisea* as yet have been placed on more or less bare sheets of rock, where excavation would be difficult, and hoof-prints impossible. Of course, the nests of the two species can never be mistaken one for the other, as those of *P. grisea* are much smaller, and are invariably lined with shreds of wool (probably stolen from the blankets of cowherds).

"Out of eight Crown-crests' nests examined and recorded, I have never found more than three eggs. In one instance only I found two hard-set eggs. The eggs vary considerably in shape, size, and markings, but those found in one nest are always of the same type. The prevailing ground-colour is a dull white, and the markings vary from bold irregular blotches of earthy-brown and inky-purple to minute freckles of pale brown. The following is a record of the dates on which eggs were found:—

" Oct. 15th.	1 nest with 3 eggs fresh.
" 16th.	" 2 "
" 23rd.	" 2 "
" 27th.	" 2 "
Nov. 3rd.	" 1 "
" 10th.	" 2 eggs hard set.
" 23rd.	" 3 eggs fresh.
" 23rd.	" 3 "

"It is not unusual to find single eggs of this species prematurely laid on the bare ground before any nest has been prepared. I have watched such eggs from time to time, but have never found a second egg laid in the same place. Miss Cockburn states (Rough Draft) that *S. malabaricus* never sings on the wing; I think this must be a mistake. I have heard this bird myself singing as it soars hundreds of times, and Mr. Fairbank, in describing

S. hayi (I presume he refers to the same species), says, 'it is a true Sky-Lark, singing as it mounts.'

Messrs. Davidson and Wenden remark, writing from the Deccan :—"Very numerous and breeds in July and August."

The eggs, many of which Miss Cockburn kindly sent me along with one of the parent birds (so that there can be no mistake as to the species), are, as might be expected, very Lark-like in their appearance. In shape they are moderately broad ovals, somewhat pointed at one end, and they have little or no gloss. The ground-colour is a dull white, and they are profusely spotted and blotched with dull pale yellowish brown and dingy inky-purple; in some of the eggs the markings are comparatively small, and so thickly set as to leave but little of the ground-colour visible, the markings assuming the character of a dense uniform mottling. In others the markings are larger and far less closely set, fully half the surface of the egg being free from marks.

As a body, the eggs of this species besides being larger are distinctly more strongly and better marked than those of *G. deva*. The great majority of these latter at a distance of a yard look quite uniform in colour, while at the same distance more than half of those of the present species are seen to be quite distinctly freckled, mottled, and streaked with a darker tint.

In length they vary from 0·85 to 0·92, and in breadth from 0·63 to 0·68; but the average of eighteen specimens is 0·87 by 0·65.

Ammomanes phœnicura* (Frankl.). *The Rufous-tailed Finch-Lark.

Ammomanes phœnicura (Frankl.), *Jerd. B. Ind.* ii. p. 421; *Hume, Rough Draft N. & E.* no. 758.

The Rufous-tailed Finch-Lark, so far from being, as Jerdon says, rare in the Central Provinces north of the Nerbudda, and unknown in the North-western Provinces, is common enough in the Sambhulpoor, Jubbulpoor, Saugor, and Jhansi Districts, and in Gwalior, and is by no means very rare in Etawah, Agra, Allypore, &c., and in the eastern portions of Rajpootana. About the Sambhur Lake, for instance, it is very common. Further west, and throughout Sindh and the trans-Jhelum and Indus, Punjab, it is replaced by the next species, *A. phœnicuroides*.

It is not, so far as I know, at all a migratory bird, though it shifts its feeding-ground according to season; and it is to be found breeding, I believe, in all the localities mentioned, as also in many parts of Southern India, where the climate and soil are not too damp to suit it.

The breeding-season, so far as I know, lasts from February to April. Tickell, as it will be seen, says that he found its eggs in June, but one can never feel sure that he is correct, and the nest he describes is more like that of one of the *Mirafra*s.

The nests that I have seen have all been very slight circular pads

of fine grass or roots, sometimes sparsely lined with softer materials, placed in some slight natural depression, or a tiny hollow scratched by the birds themselves, under the shelter of some clod or large stone, or at the foot of a tuft of grass or dwarf bush.

Four is the full complement of eggs. I have never found more, and *per contra* have repeatedly found three more or less incubated.

From Raipoor Mr. F. R. Blewitt writes:—"This Rufous-tailed Lark pairs in February and breeds in March and April, though I had hard-set eggs brought to me in the beginning of May. It makes its nest on the ground, generally in ploughed lands, often under the cover of a clod of earth. The nest is simply a moderate sized circular hollow in the earth, say about half an inch or so deep, without the 'grass and other materials' referred to by Dr. Jerdon; at least this was the case in the score and odd nests discovered by me and my men. Four is the maximum number of eggs. Its favourite haunts are open plains, stubbles, and ploughed fields; but I never witnessed it, and I have well observed the bird's habits, ascend suddenly in the air by a few interrupted shakes of its wings, uttering at the same time a pleasant, loud, whistling note, something like *too-who* (the note is altogether different), 'and then descend with a sudden fall.' On the contrary, it is not 'very rarely,' but *very often*, in the breeding-season, that it perches on a low bush or twigs, and utters the meanwhile its short, *twirling*, melodious note."

Dr. Jerdon says:—"It makes its nest on the ground of grass and other light material, generally under the shelter of a clod of earth or tuft of grass, laying three or four eggs, dirty greenish white, with numerous small brown spots. It breeds about Jaulnah in February and March. Tickell found it breeding in Central India in June."

Mr. E. C. Nunn remarks:—"I found the nest at Hoshungabad on the 28th April, 1868. It was placed in a cavity of the river-bank, and was composed of fine roots of grass, lined with wool and a few feathers. It measured 3.5 inches in diameter internally, and contained three fresh eggs."

Colonel Tickell's account is:—"Nest flat, shallow, circular, 4 inches in diameter, placed in meadows in long grass, which it entwines over the nest, leaving only a small passage open. Eggs four, lengthened, blunted, 0.87 by 0.62, dirty greenish white, thickly sprinkled with pale and dark brown confluent spots. Lays in June."

Colonel Butler writes:—"Belgaum, 18th April, 1880, 3 fresh eggs. The nest was a simple cup of dry grass placed in a hollow under a ledge of earth or an open *maidan*, from which the surrounding grass had been burnt away. 20th April, another nest exactly similar, containing a single young bird ready to leave the nest. 4th May, another nest well lined with rat's fur and goat-hair, and placed under a good-sized stone; contents 3 incubated eggs."

Memra. Davidson and Wenden, writing of the Decan,
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say:—"Very numerous. Seen with *Mirafra erythroptera* also perching on telegraph-wires. Breeds plentifully throughout the Poona and Sholapoor Districts in April and beginning of May. Their nests, as a rule, are built in a hole in a bank, either of a river or a nullah, but sometimes in an ordinary *bund*. Nest well lined with hair and wool and warmly made—like a Robin's. All the nests taken by Davidson during last season contained but two eggs each, but a nest containing four young Larks, which he believed to be of this kind, was brought to him in May."

The eggs have but little gloss, and in shape are moderately elongated ovals slightly pointed towards the smaller end. The ground-colour is creamy or pale yellowish white, pretty thickly freckled and speckled all over, but most densely at the large end, with yellowish or at times somewhat reddish brown, with which freckling very pale inky-purple blotches or spots (only faintly visible) are here and there intermingled.

The eggs vary from 0.77 to 0.95 in length, and from 0.56 to 0.65 in breadth; but the average of twenty-six eggs is 0.85 by 0.62.

Ammomanes phœnicuroides* (Blyth). *The Desert Finch-Lark.

Ammomanes lusitana (Gm.), *Jerd. B. Ind.* ii, p. 422; *Hume, Rough Draft N. & E.* no. 750.

The Desert Finch-Lark breeds throughout the rocky barren hills of Sindh and Western and North-western Punjab. It lays in April, May, and June, but I have never myself found the nest or seen it *in situ*.

Captain Cock wrote:—"This Lark breeds in the low hills of the Peshawur Valley. Its nests are abundant in the hills near Nowshera. May and June are the nesting months. The nest is placed under a shelf of rock or flat stones upon the ground, and is constructed of grass-stalks lined with fine roots, and the bird piles up little flat pieces of stone all round the nest, just as I have observed *P. grisea* do in that neighbourhood. The eggs resemble those of *P. grisea*, only they are much larger. Three seems to be the usual number, but I think I once took four eggs out of one nest."

The eggs are very regular ovals, some rather broader, some slightly more elongated, and more or less compressed towards the small end. The eggs have a very faint gloss, and the shell is particularly fine and smooth. The ground-colour is white, not absolutely pure, but with a scarcely perceptible brownish, greyish, or greenish tint, varying in different eggs. The eggs are only moderately thickly sprinkled over with specks and small spots of pale yellowish brown; these markings are always most numerous towards the larger end, where they form, or exhibit a tendency to form, an irregular, partially confluent cap or zone, as the case may be; and where

these markings are dense, there a number of tiny spots and clouds of pale lilac are to be found intermingled.

In length the few eggs I possess vary from 0·78 to 0·87, and in breadth from 0·59 to 0·62.

Pyrrhulauda grisea (Scop.). *The Ashy-crowned Finch-Lark.*

Pyrrhulauda grisea (Scop.), *Jerd. B. Ind.* ii, p. 124; *Hume, Rough Draft N. & E.* no. 700.

The Black-bellied or Ashy-crowned Finch-Lark breeds pretty well all over the plains of India. The breeding-season varies from January to August. They have two broods—the first clutch is commonly laid in February and March, and the second in July and August. The time perhaps varies a little, according to locality, but chiefly according to individual birds. In the same district, Etawah, I have myself found eggs on the 22nd February, 11th, 20th, and 21st March, 4th and 23rd April, 10th May, 28th July, 4th, 17th, and 21st August, so that I cannot believe that locality has much to do with season.

The nest is always on the ground, and placed in some little depression (a hoof-print being a favourite site), at times perfectly exposed to view, at others shaded by a large clod of earth or a tussock of grass. All the nests that I have seen (fully thirty in number) were tiny soft pads, about 3 inches in diameter and about three fourths of an inch in thickness, composed of thread, soft tow-like vegetable fibre, a few feathers, and a very little fine grass, or at any rate of these same materials in varying proportions. The upper surface, slightly depressed towards the centre to the depth of about half an inch, formed the egg-cavity. Two is undoubtedly the normal number of the eggs, but very rarely three are found.

I may note that at Etawah we found one nest of this species also amongst the ballast, between the rails, so that here, too, the trains must have passed a dozen times day and night over the sitting bird. When we think of the terrible heat glowing from the bottom of the engine, the perpetual dusting out of red-hot cinders, it seems marvellous how the bird could have maintained her position.

Colonel G. F. L. Marshall remarks:—"This species breeds in Aylgurrh early in May. A nest taken on the 6th contained two fresh eggs. It was placed on a slight ridge in a ploughed field under a tiny sprig of dwarf (*bér*) thorn. The top of the ridge was slightly hollowed, and the cavity was lined with grass-stems with an inner lining of shreds of grass and wool. The nest was very small, even for the size of the bird."

From Puttegurh, Mr. A. Anderson wrote to me:—"The Black-bellied Finch-Lark breeds all over the North-west Province from the latter end of February to the end of March. They never lay more than a pair of eggs; these are large for the size of the bird,

and minutely freckled with greyish-brown spots on a dirty-white ground. At times the spots are more thickly distributed over the obtuse end, frequently coalescing and forming a zone.

"This little Lark breeds almost exclusively on open, fallow plains, the slightest depression (such as a cow's foot-print when the soil was moist) serving as the foundation for a nest, which is a very loosely put together structure.

"I have found immense numbers of their nests by riding slowly over suitable ground with a line of coolies. The bird sits very close, and flies up into the air from *off the nest*, i. e., without *first running* before taking wing, so that to mark the spot is an easy task.

"In February 1873 I flushed a bird, as above described, two or three times without being able to detect the nest; and nest there was, because the female came back almost immediately every time she was disturbed. Imagine my surprise at finding the nest in the centre of a lump of cow-dung, which must have been quite fresh when some cow or bullock 'put their foot in it.'

"The hollow thus made served admirably for a nest, which measured $2\frac{1}{2}$ inches in diameter by $1\frac{1}{4}$ inch in depth. It was composed entirely of fine grasses, and as the foot-print had not gone right through to the ground, I was enabled to remove the lump of dung without in any way hurting the nest.

"White-ants had left their marks all over the dry dung, so that detection was almost impossible; it was altogether the most artfully concealed nest I have ever seen.

"The male bird takes his turn on the eggs."

Mr. E. C. Nunn says:—"I myself found a nest of this species amongst the stones in the bed of the Nerbudda, near Hoshungabad, on the 6th April. It contained three eggs, and was a small nest, composed of fine grass-roots and pieces of thread."

From Sambhur Mr. R. M. Adam records:—"The Black-bellied Finch-Lark is very plentiful. It breeds about here from March till August. The first nest which I obtained was found on the 22nd April, 1870. As I was riding along the lake-edge, I saw a female with a feather in its bill, so I followed it up to its nest. The nest was nearly finished, but contained no eggs. On the 26th there were two eggs, and I think this is the normal number; but I have a record of three being found in one nest. The nest was built well out into the lake-bed on the top of a low retaining wall of a salt-pan. It was a deepish cup-shape, in diameter about 3 inches, with the egg-cavity rather less than 2 inches across and half an inch deep. It was chiefly composed of coarse pieces of grass worked carelessly together, and here and there were pieces of cloth and twine of the same material as the salt bags. Round the nest was a belt, about 5 inches broad, composed of small flakes of saline incrustation about a tenth of an inch in thickness. The pieces varied much in size, but the largest were about an inch long by half an inch broad.

"This nest was comparatively safe, but it is a puzzle to me how

others which I have seen on the lake-edge escaped being squashed by the thousands of bullocks and camels which are continually passing and re-passing.

"The eggs are pale yellowish green in colour, and covered with very minute specks of various shades of brown.

"I may add that I took a nest of this species in Oudh on the 4th May. It contained two eggs."

From Raipoor Mr. F. R. Blewitt writes:—"This Finch-Lark breeds, according to locality, from the middle of March to at least the middle of August, as I had three fresh eggs brought me on the 5th of that month at Sangor. In a slight hollow in the ground a somewhat compact nest is prepared of fine grass and roots. The shelter of a clod of earth or low bush is often preferred for the nest. Three is the largest number of eggs I have seen. Its habits are correctly stated by Dr. Jerdon, but I have never yet seen 'large flocks' of the bird in the cold season, or indeed at any other time. I have occasionally met with a dozen or two together, either on a road or a favourite feeding-ground. During the breeding-season the male bird does occasionally, as I have witnessed, 'sing in the air like a Lark with expanded wings' for a minute or two. It is common in both the Sumbulpoor and Raipoor Districts."

Mr. A. G. R. Theobald remarks:—"I found a nest of this species at Salem on the 21st August. It was merely a small circular cavity in a bare open field, lined with a little fine dry grass. In contained three eggs."

Lieutenant Burgess tells us that "this little bird breeds in Western India, during the months of January and February, building its nest in a hollow in the grassy plains which it inhabits."

Mr. E. Aitken tells me that "in Poona it builds all over the rocky plains in the cold season. I have found eggs on the 24th December and on the 12th February. The nests I have seen have always been beside a stone or sheltered by some little plant, and consisted of an oval-shaped hollow in the ground, lined neatly with grass. I have found a single egg in a nest, half hatched; but at other times always two. I have seen the male incubating the eggs."

Dr. Jerdon recorded long ago that he "obtained the nest and eggs in February. The nest was composed of woven thread, mingled with some fibres of grass and one or two small fragments of cloth. The sides are hardly raised at all; it was placed in a slight hollow on the open plain, near a river, and contained two eggs of a slight greenish-grey tint, spotted with brown chiefly at the larger end."

A nest was found at Kurachi on the 22nd April with two fresh eggs.

Colonel Butler writes:—"I found a nest of the Black-bellied Finch-Lark at Deesa on the 19th October, containing two incubated eggs. The nest consisted of a nest but loosely made pad of dry grass and *Caletropis*-down, placed under a small tussock of grass

amongst some stones in a dry river-bed. I took another nest on a bare maidan in the same neighbourhood on the 6th November containing two fresh eggs.

"Belgaum: 8th Oct., two fresh eggs. 25th Feb., two incubated eggs. 21st March, two fresh eggs in one nest, and two young birds ready to fly in another. I also found nests on the following dates:—26th Oct., 3rd Dec., and 6th Dec., all three nests containing two incubated eggs. Another nest in Belgaum on the 23rd April containing two fresh eggs."

Mr. J. Davidson tells us, writing from Sholapur:—"This is a common bird both here and in Sattara, and seems also to breed over a great part of the year. I found its nest with *one* fresh egg at Patan (Sattara) in December; again, with two young at Adul (Sattara) in February; again in the beginning of May in Sattara; and in considerable numbers in July, August, and September in Sholapur. The nests were a mixture of grass, shreds of cloth, and feathers, easily distinguishable from those of the Small Crested Lark, which, as far as I could judge from numerous specimens, were entirely made of fine grass. They were placed on the ground in a slight depression, frequently touching the stalk of a tallish weed, but always, as far as I observed, where the grass is very short. I have never observed more than two eggs, and have often (ten times or so) found them fully incubated."

And he continues:—"About three weeks ago I got another nest of this Finch-Lark with two fresh eggs, so I think it really breeds through the whole year in this part of the Deccan."

Captain Horace Terry says:—"I found a nest of this Lark at Bellary on the 7th December, placed on the roof of a godown adjoining my bungalow. Nothing very odd in this, perhaps, but I have often noticed these birds have a fondness for some small stones round the edge of their nests, and sure enough this bird had a very fine collection of them up there. How they got there it is difficult to say. One can hardly imagine the birds took the trouble to take them up there, but I suppose they must have."

Mr. G. Vidal, writing of the South Konkan, remarks:—"Very common in the more open country, in fields and rocky tablelands. Breeds in October, November, and again in April. The nests are tiny cups of grass, lined with tow and shreds of wool, probably pilfered from the blankets of cowherds. I have never found more than two eggs in a nest. This species is very abundant on the rocky laterite plateau on the summit of the cliff at Ratnagiri. Here it builds its nest on the bare surface of the sheet rock. The nests are not hollowed out, but are built in all round with a little wall or embankment of loose gravel and detritus. There is no attempt at concealment, but as a sort of landmark, and perhaps with an idea that it gives protection, a small stone, from four to six inches high, is invariably found at the side of the nest. In fields and wherever the soil admits of being dug up, a small hollow is scooped out, or else a natural hollow, such as a hoof-mark, is

chosen, but in these situations also I have always observed the small protecting stone."

Colonel Legge sends the following note:—

"This Little Lark is resident throughout the year in all the eastern and north-eastern parts of Ceylon, and also in the dry district of the north-west coast. I found it breeding this year near Trincomalie in May and June. It commences to build at the latter end of April, choosing the barest parts of open wastes, commons, dried-up paddy fields, &c. Three nests, which I found on the Esplanade, were constructed in holes scooped in the ground, with the surface of which the top of the structure was flush. They were very loosely put together of small dry grass, stalks and roots, bits of rag and pieces of thread and cotton, with no particular lining. Round the edge of the nests were placed a neat little circle of small pieces of tile and brick, which, in this case, must have been gathered in from some little distance, as the ground hard by was quite bare. Two was the number of eggs in these and other nests found."

Mr. J. B. Cripps, writing from Furreedpore, in Eastern Bengal, says:—"Pretty common. I have not noticed it from November to February, and am of opinion that it leaves the district during those months; its habits, &c., are well described by Jerdon. I once found its nest in the dry bed of the river that was in front of my house; it was on the 20th April, 1878; the nest was a tiny cup-shaped affair of fine grass-roots, which were firmly held together by damp sand, so much so that on taking it up it appeared like a ball cut in two; it contained two fresh eggs; there was not even a small tuft of grass anywhere near where the nest was; only some tamarisk-shoots above and shading it."

The eggs, as might be expected, are typical Larks' eggs, moderately elongated ovals, somewhat pointed towards one end. The ground-colour, yellowish-, greenish-, or greyish-white, is more or less densely mottled, speckled, spotted, or finely streaked or freckled (the character of the markings varying a good deal in different eggs) with various shades of yellowish and earthy brown or grey. The markings are more hazy and indistinct as a rule in this species than in either *Mirafra assamica* or *M. erythroptera*, and in some are so uniform and confluent as to obscure the ground-colour entirely. With the exception of the eggs of *A. raytal*, these are the smallest of all our Indian Larks' eggs. They have, like those of the rest of their congeners, a more or less perceptible gloss.

In length they vary from 0·65 to 0·8, and in breadth from 0·5 to 0·62; but the average of thirty eggs is 0·73 by 0·55.

***Pyrrhulanda melanauchen* (Cab.).** *The Black-crowned Finch-Lark.*

Pyrrhulanda melanauchen (Cab.), *Hume, Cat. no. 760 bis.*

Mr. Scrope Doig found the nest of this species in Sind. He says:—"This bird, wherever there are sand-drifts, is very common and is never, as far as my experience goes, found in company with *P. grisea*. They breed at the end of February and beginning of March, at the end of May and commencement of June, and again in the end of August and beginning of September. One breeding-place I found in this latter month was situated away from the Narra, some 10 miles out in the desert near some salt deposits, and where evidently rain had fallen, as there was a considerable growth of grass. The nests were very similar to those of *P. grisea* both in size and description, and were invariably placed at the root of some tuft of grass, on the north side, evidently to be sheltered from the hot wind. In this place I collected over forty eggs. They are very similar to those of *P. grisea*, perhaps, as a rule, more boldly marked, and some of them had well-defined rings of colour round the larger end. The normal number of eggs is two."

The eggs seem to be typically rather elongated ovals, but they vary a good deal in size and shape, the shell is fine, and in some eggs has a tolerable amount of gloss, in others but little. There are many types of eggs which are variable, like those of all Larks. In one the ground-colour is a dull pale creamy stone-colour, and the egg is everywhere mottled with tiny clouds of pale brownish yellow and speckled with pale lilac, the markings being everywhere small and insignificant, but a little better marked in an irregular zone round the large end. In another type the ground-colour is a china-white. The large end of the egg is thickly spotted and blotched with umber-brown intermingled with clouds of pale inky grey, and spots and specks of the same two colours, chiefly the former, are thinly scattered over the rest of the egg. In the first type the shell was almost glossless and all the markings blurred and insignificant; in the second the shell has a good gloss and the markings are all distinct, well-defined, and towards the large end almost bold. Of course, intermediate forms occur.

The eggs vary from 0.68 to 0.82 in length, and from 0.5 to 0.58 in breadth.

Family NECTARINIIDÆ.

Subfamily NECTARININÆ.

Ethopyga scherzeri, Tick. *The Himalayan Yellow-backed Sun-bird.*

Ethopyga miles (Hodgk.), *Jerd. B. Ind.* i, p. 302

Ethopyga goalpariensis (Lath.), *Hume, Rough Draft N. & E.* no. 225.

According to Mr. Hodgson's MSS. and drawings, the Himalayan Yellow-backed Sun-bird begins to lay in April, the young being fully fledged in July. The nest is purse or rather Florence-flask shaped, suspended from a twig; about 6 inches in length and 3 in breadth at the widest part, with an oval entrance (commencing about 2 inches below the point of suspension) about $1\frac{1}{2}$ long by $1\frac{1}{4}$ inch broad. There is no portico or projection above the entrance. The nest is composed of black moss and other fine roots, with a little moss compactly interwoven with some cobwebs, and lined with silky cotton-like fibre. The eggs are two or three in number, greyish white, speckled with brown, and measuring about 0.65 by 0.45 inch; in shape rather broad ovals, pointed towards the small end.

Mr. O. Moller writes to me from Sikkim:—"This beautiful Honey-sucker is very common here, but I have only succeeded in finding 4 nests of it, 3 of which were found in May, and one in August; the nest is always suspended from or close to the end of a twig, 3 to 4 feet from the ground; the number of eggs is 2 or 3."

The nest is an elegant hanging purse of an elongated pear-shape suspended from the petiole of a large leaf, 6 or 7 inches in length and 2.5 in external diameter, with an oval entrance on one side from 2 to 2.5 inches from the bottom, from 1.75 to 2 inches high by 1.0 to 1.25 broad. The interior cavity below the edge of the opening is about 1.5 inch deep and a little less in diameter.

The external portion of the nest is composed entirely of fine black rootlets loosely filled with grass, in which a few dry blades of grass have been incorporated longitudinally as if to strengthen and stiffen the structure. Interiorly the entire nest is lined with extremely fine pale brown flower-stems of flowering-grasses, and the whole bottom of the cavity is thickly filled with fine silky seed-down.

The eggs are pretty regular ovals, some slightly pyriform, some slightly more elongated. The shell very fine and smooth, but quite devoid of gloss. The ground-colour is pure white, and this is finely streaked and speckled pretty thickly about the large end, where there is sometimes an irregular cap or zone, and rather thinly elsewhere, with a dull greyish purple varying from a sort of chocolate in some spots to almost sepia in others. Four eggs measured from 0.57 to 0.6 in length by 0.45 to 0.47 in breadth.

***Æthopyga vigorsii* (Sykes). Vigors's Yellow-backed Sun-bird.**

Æthopyga vigorsii (Sykes), *Jerd. B. Ind.* i, p. 303.

Mr. Ludovic Stewart sends me the following note regarding the breeding of this Sun-bird:—"I found a nest of *Æthopyga vigorsii* at Mahableshwar carefully hidden in a trellis of passion-flower in the verandah of my house. It was purse-shaped, of moss and lichen outside, and soft pappus of a composite plant within, a round opening near the top, but no shelf over the opening. I did not take the nest (June 8), as it contained three young."

Messrs. Davidson and Wenden, writing of the Deccan, say:—"Fairly common along the ghâts and breeds at Mahableshwar." And Mr. H. Wenden further remarks:—"17th Sept., found nest suspended from bush growing out of face of cutting at upper entrance of No. 19 tunnel, Bhore Ghâts. Shot both male and female. Missed the latter twice, but that did not deter her returning to the nest each time within a couple of minutes after being fired at. 3 eggs quite fresh. Saw several other pairs about. On 21st Sept. found another up a hill-side, about 200 yards from where I got the first. It was suspended from the outer end of a branch, 5 feet from ground."

The egg of this species, sent by Mr. Wenden, is a moderately broad oval distinctly pointed towards one end. The shell, though very fine and delicate, is entirely glossless. The ground-colour appears to have been white, but it is everywhere so thickly freckled over with dull pale yellowish brown, that nothing certain can be said in regard to it. Besides this freckling there are several clouds and ill-defined spots of a darker shade of the same brown, and near the large end a single excessively fine twisting hair-line which is almost black. It measured 0·63 by 0·48.

***Æthopyga saturata* (Hodgs.). The Black-breasted Yellow-backed Sun-bird.**

Æthopyga saturata (Hodgs.), *Jerd. B. Ind.* i, p. 307; *Hume, Rough Draft N. & E.* no. 231.

The Black-breasted Yellow-backed Sun-bird, according to Mr. Hodgson's notes and drawings, builds a beautiful, pear-shaped, hanging nest, about 6·5 inches in length by 3 in breadth at the broadest part. The nest is hung at the end of a slender thorny twig, and is composed of moss, bound together with little strips of bark and vegetable fibre, and is lined with the soft down or pappus of some asteraceous plant. The entrance is almost immediately below the point of suspension, and is screened by an awning, which projects about an inch and hides more than half of the entrance-hole. They began to lay, it appears, in April, two or three being the number of the eggs, which, however, are neither described nor figured. Like the rest of this genus, it breeds only once in the year.

The eggs of this species are somewhat elongated ovals, only very slightly compressed towards the small end. The shell is extremely fine and fragile, but entirely devoid of gloss. The ground-colour is a dead white, and it is rather thinly spotted, streaked, and blurred with a rather pale brown, at times somewhat darker, and with a faint reddish or purplish tint; not unfrequently a number of the markings combine to form an irregular zone often more or less confluent about the larger end.

Three eggs, found on the 22nd May, measure 0·61 by 0·44, 0·58 by 0·43, 0·57 by 0·44.

Æthopyga nepalensis (Hodgs.). *The Nepal Yellow-backed Sun-bird.*

Æthopyga nipalensis (Hodgs.), *Jerd. B. Ind. i*, p. 336; *Hume, Rough Draft N. & E. no. 229*

Of the Nepal Yellow-backed Sun-bird, Dr. Jerdon remarks that "it is the most common species at Darjeeling, being often seen in gardens in the station. There I obtained a nest of this bird, very neatly, though loosely, made of moss, domed at the top, with the entrance at the side overhung by a sort of projecting roof; it contained two eggs, of a dusky-greenish tinge, with numerous small dusky spots."

According to Mr. Hodgson's notes and drawings, this species begins to lay in April, and builds a comparatively large, oval, hanging nest (composed of moss and wool, and lined throughout with silky down), which is attached to some leafy twig, at an elevation of from 3 to 5 feet from the ground. These birds, it is said, breed only in Nepal, in the central hill-region, frequenting groves and open forest, in which also their nests are always found. The dimensions of a nest which are given accord well with those of the figure. The nest is egg-shaped, 7·75 inches in length by 4 in breadth, and a little above the middle is an oval aperture about 1·62 by 1·0 inch. There is no portico or projection above this, and whereas in the nest of *Æ. scheria* dark-coloured hair-like roots seem to constitute the chief components of the nest, in the present species green moss and white wool-fibres seem to predominate. They lay two or three eggs, which are figured as moderately broad ovals 0·68 by 0·43 inch. The eggs are represented as nearly white, with a certain amount of reddish mottling towards the large end. They have only one brood in the year, and both birds participate in rearing the young, which are ready to fly in July.

Arachnechthra lotenia (Linn.). *Loten's Sun-bird.*

Arachnechthra lotenia (Linn.), *Jerd. B. Ind. i*, p. 372.
Cinnyris lotenius (Linn.), *Hume, Cat. no. 235.*

Mr. E. H. Aitken thus writes on the nidification of this Sun-bird:—"As far as I know there is nothing on record about the breeding of this Sun-bird, and since I went to Uran on the so-

called Island of Karanja, where the bird is not uncommon, I have been on the watch for its nest. It is a permanent resident, frequenting the sides of the hills, and incessantly uttering the loud cheery note which serves at once to distinguish it from the other members of its family. It seems fonder of flowers than either *A. asiatica* or *A. zeylonica*, and often hovers over them like a hawk-moth, inserting its long tongue.

"In October I suspected strongly that a pair had a nest somewhere in a well-wooded slope close to my house, but I did not succeed in finding it. Later on I saw a pair followed by two young ones, and my heart sank within me. But the birds themselves came to the aid of science, and, about the beginning of November, made a beautiful nest in the middle of a small tree close to my verandah. I had to watch it carefully, for there was a pair of *A. zeylonica* in the garden. However, the birds were not shy, and I soon had abundance of opportunity of assuring myself about the ownership of the nest. As I frequently saw the female going in and out, I concluded the eggs were not yet laid; so I waited a week, and then one morning I went cautiously up and touched the nests with a long stick. In a moment the bird darted out and flew round and round me, screaming and calling all the birds of the neighbourhood together. It is one of my rules not to take nests in my own garden, but on this occasion I thought the rule would be more honoured in the breach than the observance, so I mounted a chair and cut the nest down. What was my horror on discovering that it contained one egg and one young one, just hatched. I plunged the other egg at once into cold water, and left it in for five minutes in order to kill the chick, if there should be one. Alas! next evening, thirty-six hours after, this egg too was broken, and a little naked thing was struggling to get out. I have, therefore, only the broken shell of one egg and the nest for my spoil. The nest, as you see, is remarkably long, measuring fully 10 inches. Otherwise it is very similar to that of *A. zeylonica*, having the entrance near the top protected by a portico. It is constructed of fine fibres and grass, and covered all over with small pieces of bark and other rubbish, chiefly that favourite material with all Sun-birds, the woody refuse with which wood-boring caterpillars cover the entrances of their holes.

"The egg is not an ornamental one. The ground-colour is a dirty brownish white, the smaller end being thickly covered with dull brown spots, which pass into larger confluent blotches and form a cap on the other end."

***Arachnecythra asiatica* (Lath.). The Purple Sun-bird.**

Arachnecythra asiatica (Lath.), *Jerd. B. Ind.* i, p. 370; *Hume, Rough Draft N. & E.* no. 234.

Arachnecythra intermedia, *Hume*; *Hume Rough Draft N. & E.* no. 234 bis.

The Purple Sun-bird lays at very different periods of the year

in different localities, as indeed may be gathered from the various notes which are subjoined. They breed all over the plains of India, up to the very summit of the Nilghiris, and up to about 5000 feet, as a maximum, in the Himalayas. They certainly have two broods in rapid succession, usually in the same nest, and I am not at all sure that they do not have more. They will build almost anywhere; in and about gardens and in the verandahs of houses, in little clumps of acacia trees, especially where these overhang water, and far away in the jungle, or in the cane-brakes of the Terai. When attached to shrubs or trees, the nests are generally suspended from the fine terminal twig of some branch or the frond of a cane.

The nest is pendent, and composed of *all kinds of materials* beautifully woven together with the silkiest fibres and cobwebs; hair, fine grass, pieces of decayed wood, lichens, rags, thorns, &c., are all pressed into the service. The body of the nest is oval, generally, with all sorts of little pendent pieces of wood, &c., hanging *below*, as ornaments apparently, while the apex of the oval is prolonged into a cone meeting the point of support. A little above the centre of the oval, a small circular aperture is worked, and just above it a projecting cornice, 1 to 1½ inch wide, is extended; then on the opposite side of the oval, the wall of the nest, which is ready some days before the eggs are laid, is pushed out or bulged out a little so as to give room for the sitting bird's tail. The bulging-out of the back of the nest is one of the last portions of the work, and the female may be seen going in and out trying the fit, over and over again. When sitting, the little head is just peeping out of the hole under the awning. I remember in February 1867 seeing a nest suspended to a punkah cane which was stretched across Brook's verandah at Etawah. This nest was founded on two or three narrow strips of gun-rag, which had been left hanging across the cane, black, and smelling of gunpowder. Yet with these unpromising materials and plenty of silky grass, &c., it made a pretty little pendent home.

The normal number of the eggs is certainly two, but three are said to be sometimes met with; indeed I have a note of a nest taken on the 4th April by Mr. Adam which contained this number; still, out of more than fifty nests which I have myself examined, none contained more than two.

As regards the portico, this, though general, is not universal, and I have seen many nests in which it was entirely wanting. *A propos* of this, and of the nidification of this species generally, Mr. F. R. Blewitt, detailing his experiences in Jhansie and Saugor, sends me the following remarks:—

"The breeding commences about the middle of May and ends about the middle of August. The nests I always obtained on thorny trees, principally on small keekur and plum. The nest is in form what may, for want of a better term, be called gourd-shaped, with a neck more or less longish. In the exterior construction of the nest, brown-looking chips of some kind of bark,

bits of (and entire) leaves, fine grass, &c., all intermixed, are attached and woven together by spiders' webs. The lining of the nest is invariably silky-white seed-down, very neatly affixed to the interior of the structure. The entrance is either a small circular or somewhat oval-shaped hole, about or just above the centre of the nest, with a very slightly projecting awning above it. But this awning is not in every nest. Out of some 18 nests obtained by me, seven or eight only had it. I venture to state that this awning is only added when the nest is about perpendicular in position, and where therefore a necessity exists for this additional protection for the entrance. I am the more particular to note this fact, because every nest with the awning was, when discovered, in a perpendicular position; while those I saw without it were so attached as to stand out a little slantingly, and had the entrance on what may be called the underside; I never saw the entrance-hole at the bottom as Colonel Tickell pretends. The eggs in colour are whitish, minutely speckled with light brownish spots, on some eggs closely coalescing at the larger end. The regular number of eggs appears to be two or three. I found the length of the nest to be from 7 to 8·5 inches and from 2·8 to 3·4 in breadth."

And referring to the Sun-bird which I at one time named *A. intermedia*, he further writes:—"Hume's Purple Honey-sucker is numerously met with in the extensive forest tracts of the Raepore and Sumbulpore Districts. It is usually met with singly or in pairs; occasionally three or four may be seen on the same tree feeding on the nectar of the flowers. Its habits are very similar to those of *Arachnecethra asiatica*. The note is a feeble chirp, somewhat resembling that of this latter Honey-sucker. It breeds from some time in February to the end of April. The nest is bottle-shaped with a more or less lengthened neck, and constructed externally of fine grasses, with here and there small chips of soft bark, leaves, or spider's web attached to it. The interior lining is composed of seed-down; a small circular hole is made about the centre for the entrance.

"The nest is suspended from the end of some small branch of a low bush or small tree. On the 15th March my men brought me three eggs (hard-set), and the nest found on the branch of a low bush overhanging a small stream. In April (I forget the date) a nest, with two eggs, was secured on the branch of a fruit tree in a garden."

Colonel G. F. L. Marshall writes:—"Breeds in March and April in the Saharunpoor District, the young being hatched about the middle of the latter month. It builds an elegant pensive nest, bottle-shaped, with entrance at side, and a slight awning-like projection over it; it is generally placed about 3 or 4 feet from the ground hanging from the end of a bough; it is made of fine grass and straw woven together with cobwebs and covered outside with dead leaves and seeds. The eggs, generally two, sometimes three in number, are large for the bird, of an elongated oval shape and

of a dirty white colour covered with dingy spots, which sometimes tend to form a zone at the thicker end."

Captain Hutton says:—"We found a nest on the 29th of May in the Doon, containing three eggs.

"The nest is a beautiful little structure somewhat pear-shaped, or rather, perhaps, resembling a miniature soda-water bottle, tapering upwards to a point which is attached to a thin twig. The mouth of the nest is placed at one side near the top, and has a very conspicuous shade or verandah projecting over it, composed of very fine fibres of the seed-stalks of minute grasses. The lining consists of fine fibres and silky seed-down intermixed. It is somewhat rudely constructed externally of blades of grass, bits of various kinds of leaves, fine shavings and fibres held together by cobwebs and seed-down, not interwoven, but sparingly plastered over the other materials, and most abundant at the point of attachment to the twig from which it depends. In the specimen before me there is much excrement of some species of caterpillar spread over the surface, and seemingly not by the insect, but by the bird, as it is found adhering to the bottom as well as to the sides of the nest. It is, however, much more abundant at the upper part, where it appears to have accumulated, as if dropped from the branch of the tree."

Mr. Brooks tells us that this species "is seen occasionally in the valley near Almorah. On the banks of a small river there, I found a nest of this bird being built in May. The bird lays in March in the plains."

From Murree, Colonel C. H. T. Marshall says:—"Found several nests of this species in May and June, in the lower valleys, about 4000 feet up."

Mr. R. M. Adam remarks:—"The Purple Honey-sucker is very common about Sambhur; it breeds during the month of April and up to June. On the morning of the 18th April, I saw a female apparently in a great state of excitement over a piece of cobweb in a tree, and I succeeded in lining it like a bee, until I found the beginning of a new nest on a babool tree, about 15 feet from the ground. On the 19th it had the upper portion of the nest well formed; on the 20th the nest was well blocked out, but had no inner lining. From the 21st to the 24th, the bird was occupied in ornamenting the outside of the nest with all sorts of stray feathers and other odds and ends. During these days it also filled in the inner lining.

"It is curious how fond these birds are of tacking on pieces of paper and, here and there, a bright-coloured feather from a Paroquet or a Roller on the outside of their nests. When in Agra, a bird of this species built a nest on a loose piece of thatch cord in my verandah, and on the side of the nest, stuck on like a sign-board, was a piece of a torn-up letter with 'My dear Adam' on it.

"On the 26th I found the bird sitting on the nest, and I presume it had eggs, but I did not care to disturb it, and on the 27th, for

the first time, I saw the male bird near the nest. All through the time of construction, so far as my observation went, he never assisted the female in the slightest degree. Now he seemed exceedingly happy, fluttered every now and then about the nest, and after each careful inspection he was so seemingly pleased with the handiwork of his mate that he perched on an adjoining branch and poured forth a joyous strain, flapping his wings and making his axillary feathers rotate in the most extraordinary manner. On the 13th of May the young were hatched, and I never once observed the male coming near the nest to feed them; about the 24th the birds were well fledged. It does seem strange that the male of this species should not take any part in the construction of the nest, the hatching or the rearing of the young; but I presume that the reason of this is, that his conspicuous plumage about the nest would attract the attention of birds that might destroy it. While in Oudh I had a nest of this bird brought to me with two hard-set eggs on the 7th April, and another nest with feathered young on the 10th April; again on the 14th April, I had a nest brought me with three eggs. The eggs were a pale bluish green, with delicate freckles of neutral tint, most abundant on the thick end. In Agra I have taken the nests in June and July.*

Dr. Jexon has told us that "a pair built their nest just outside my house-door at Jalna. It was commenced on a thick spider's web, by attaching to it various fragments of paper, cloth, straw, grass, and other substances, till it had secured a firm hold of the twig to which the spider's web adhered, and the nest suspended on this was then completed by adding other fragments of the same materials. The entrance was at one side near the top, and had a slightly projecting roof or awning over it."

Major C. T. Bingham remarks:—"This Sun-bird breeds commonly both at Allahabad and at Delhi in March, April, and May."

Mr. Benjamin Aitken remarks:—"19th January, 1871. Found a nest in a babool tree at Akola, Berar, about 7 feet from the ground. It contained two eggs, which were exactly alike. They were taken by me two or three days after they were laid, and the birds then forsook the nest."

"This species is by no means regular in the period during which it undergoes change of plumage, and I have once at least seen two males on the same day, one in summer plumage, and the other in full breeding-plumage"*.

Colonel E. A. Butler writes from Sind regarding this species:—"Nests were abundant at Hyderabad in May and June."

Again, from Deesa he records the following strange incident:—"A Honey-sucker's nest (*A. asiatica*) was brought to me containing two eggs. I examined them, and fancying they were hard-set, did not attempt to blow them, but placed them on some cotton-wool in a box and left them lying upon my table."

* I have elsewhere recorded my belief that the Sun-birds have no seasonal change of plumage.—Ed.

"In eight or nine days (I am not quite certain which) I took them out of the box and attempted to blow them, and in doing so broke them both, when to my utter astonishment I found that each contained a living chick, almost ready to hatch.

"The temperature of the room in which they were left varies in the daytime from 88° to 90° F., and at night from 70° to 84° F.

"I have often and often left incubated eggs of different species on my table for two or three days before blowing them, but never before, on extracting the contents, have I found the embryo alive, unless in the case of an egg quite recently brought in."

On the general subject of the nidification of this Sun-bird at Deesa, he says:—"The Purple Sun-bird breeds in the neighbourhood of Deesa all through the hot weather, often assuming the breeding-plumage as early as December. I took nests this year on the following dates:—

"Feb. 10th, 1876. A nest containing 2 fresh eggs.

"Feb. 28th. " " 2 fresh eggs.

"March 15th. " " 2 fresh eggs.

"March 19th. " " 2 fresh eggs.

"March 22nd. " " 2 fresh eggs.

"March 29th. " " 2 slightly incubated eggs.

"May 10th. " " 2 fresh eggs.

"May 11th. " " 2 fresh eggs.

"In addition to the above-mentioned I took a nest containing two fresh eggs on the 18th June, 1875, at Mount Aboo, and many others during the hot weather, which I have not mentioned. The nests and eggs are so well known that it is unnecessary for me to describe them. They often select odd places to build in. In several instances I have found nests suspended from pieces of string hanging from the roofs of houses."

Writing of Rajputana in general, Lieut. H. E. Barnes remarks: "Commences to breed in March, and nests may be found quite up to the beginning of the rains."

Miss Cockburn remarks that in the Nilghiris they generally lay in January. "Their nests are composed of cobweb stuck thickly over with small pieces of dried leaves; the whole forms a neat oblong hanging nest, the entrance being at one side towards the top, over which there is a little canopy, which gives a look of snugness and security, as if not a drop of water could enter the abode. The interior is warmly lined with the down of seed-pods, and the whole construction is generally attached to the extremity of a small branch, which the slightest breath of air puts in motion."

Mr. Rhodes W. Morgan, writing from South India, says:—"The Purple Honey-sucker builds a nest very similar to the preceding (*Nectarophila zeylonica*). It breeds both on the plains and in the hills, ascending the Nilghiris to an elevation of 6000 feet. The nest is composed of small twigs, pieces of grass and leaves, and is lined with the down of thistles and silk-cotton. It is

generally adorned with the excrement of caterpillars, small bits of rag, paper, &c. A pair that built in front of my office at Kurnool, in an acacia-tree, had the most extraordinary nest I have ever seen. It was ornamented with bits of blotting-paper, twine, and old service-stamps that had been left lying about. The whole structure was most compactly bound together with cobwebs, and had a long string of caterpillar excrement wound round it. This excrement had most probably fallen on to a cobweb and had stuck to it, and the cobweb had afterwards been transported in strips to the nest. It breeds from February to June, the majority of the nests being constructed in March and April. The eggs are thickly spotted with dusky brown on a greenish-grey ground, the usual number being three. Dimensions of an egg in my collection 0·65 inch in length by 0·46 in breadth."

The eggs of this little bird vary so much that the two extremes of a good series of its eggs could hardly at first be believed to pertain to the same species. In shape they are typically a moderately broad oval, considerably pointed towards one end; but some are nearly perfect, rather elongated ovals, and a few are short and pyriform. The ground-colour is greenish-, greyish-, or brownish-white; in some but little, in others almost entirely obscured by the markings. These latter, always minute and ill-defined, are grey, purplish grey, brown, or greyish brown. A certain number of the eggs are pretty uniformly speckled and freckled over the whole surface, but in the majority the markings are densest towards the large end, where many exhibit more or less perfect caps or zones, and to which locality in some few specimens the markings are exclusively confined. Dull, dingy little eggs, giving small promise of the brilliant offspring they are destined to produce, their colouring recalls the eggs of the Sedge-Warbler, of several species of Wagtail, and of many of our Larks; and I have before me now specimens which, so far as tint and character of markings are concerned, are undistinguishable from specimens of the eggs of these various species.

In length the eggs vary from 0·6 to 0·68 inch, and in width from 0·45 to 0·48 inch; but the average of fifty eggs is 0·64 by 0·46 inch. I have one monstrous and absolutely abnormal egg of this species, taken by Mr. W. Blewitt at Hansee on the 18th April, which measures 0·78 by 0·49 inch.

***Arachnechthra hasselti* (Temm.).** *Van Hasselt's Sun-bird.*

Cinnyris brasiliensis (Gm.), *Hume, Cat. no. 233 bis.*

A correspondent* writes:—"I found this nest five days ago, building, and this morning was fortunate enough to find the bird on the nest and two fresh eggs. I waited for nearly an hour, then saw the female on the nest, flushed, and shot her. The cock

* This note is without name, locality, or date.—Ed.

came fluttering about the nest five minutes after, and I shot him. The nest was on the end of a bough of a tree in jungle, 3 feet from the ground—the ordinary nest of this kind of bird, but built entirely of shelled bark and cobwebs (the bark of the colour of light brown paper), and lined with very fine grass, 5 inches in length and $2\frac{1}{2}$ in diameter. The entrance-hole $\frac{3}{4}$ in diameter. The nest at ten paces distant is very hard to make out, looking like a bunch of dried leaves. There was no tail or ornamentations."

The nest, a most lovely little felted purse suspended by a broad band of attachment from a slender twig, is exactly 4.25 inches in length outside. It is somewhat pear-shaped, but not much so, owing to the great breadth of the attachment. At its broadest it is 1.75 inch in diameter externally. The aperture, which is in the front of the nest, is oval, 1.5 from top to bottom, and nearly 0.75 in width. Its lower lip, if I may use the phrase, is 1.5 exteriorly from the bottom of the nest. The nest is everywhere about 0.25 inch thick, except just at the bottom, where it is about 0.5 inch thick. It is composed entirely of the glistening red-brown scales taken from the basal portions of the stems of ferns, densely felted together, and exteriorly very thinly coated with excessively fine black moss-roots and white silk from cocoons, tiny pieces of moss and lichen being laid on here and there with this slender fibrous covering, apparently for ornament. The nest has no dependent tags or streamers, but ends quite obtusely.

The eggs are tiny little ovals, a little elongated and with a slight pyriform tendency. The shell, though very fine, decidedly stout for the bird, and with a perceptible amount of gloss. The colour is a sort of brownish *café au lait*, and round the large end is a dusky-greyish mottled zone, not very markedly darker than the ground-colour. The two eggs measure 0.58 by 0.41 and 0.57 by 0.4 respectively.

Arachnechthra pectoralis (Horsf.). *The Malay Yellow-breasted Sun-bird.*

Cyrtostomus pectoralis (Horsf.), *Hume, Rough Draft N. & E.* no. 235 bis.

Of the nidification of the Malay Yellow-breasted Sun-bird, which, so far as we yet know, occurs within our limits only in the Nicobars, the following brief note by Mr. Davison sums up all we yet know:—"Although I found several nests of this species, I never obtained the eggs. On the 19th of January I found a nest at Camorta; I shot both the birds, but on climbing up to the nest found it empty. Again, on the 17th February, I found three nests, two empty, one with two very young birds."

The nest is quite that of an *Arachnechthra*, very similar to, but larger and more coarsely made than, that of *A. asiatica*. The nest is a pendent, elongated egg, a good deal drawn out towards the

twig it hangs from, 9 inches in length and 3 in diameter, composed chiefly of dry grass and cocoanut-fibre, with a few feathers intermingled in the body of the nest, and the interior thickly lined with these. About an inch below the point of suspension, the portico projects for 1.25 inch; it is about 1.5 thick; and below this is the little oval entrance to the nest, about 1.25 by 1 inch. Interiorly the cavity is about 3.5 inches deep, and below the lower margin of the entrance-hole nearly 1.75 in diameter. The portico and the upper portion or neck of the nest is chiefly coir, while the lower and broader portions are mostly grass and pieces of bamboo sheaths, a dead leaf or so, and a scrap or two of bark. There is no attempt to decorate the nest externally, as is so common in this genus; but perhaps the nest was not quite finished, though Davison says they were all alike.

An egg of this species, taken by Mr. De Roepstorff in February at Camorta, is a pale dull grey-brown, thickly streaked and freckled with a somewhat darker brown, and with a few minute specks and spots of a much darker brown, each surrounded by a sort of purplish or reddish haze, scattered very sparsely about the egg. On one side of the large end these markings seem to have a tendency to form a zone. It measured 0.61 by 0.45.

Arachnechthra flammaxillaris (Blyth). *The Burmese
Yellow-breasted Sun-bird.*

Arachnechthra flammaxillaris (Bl.), *Hume, Rough Draft N. & E.*
no. 234 ter.

Mr. W. Theobald states that he obtained a nest of this species at Tavoy on the 1st February. The nest resembled that of *A. asiatica*, and was a neat purse, suspended in a lime-tree (*Citrus*). It contained two oval-pyriform eggs, pale greenish, speckled with greyish ash, which measured 0.56 by 0.43 inch. I suspect some error in measurements here; these dimensions are apparently too small for the bird.

Mr. Oates, writing from Pegu, says:—"I have found the nest of this bird from the commencement of July to the end of August. On the 3rd of the former month I observed a female of this species attaching a piece of grass to a twig. On the 8th the nest looked quite finished, and on the 14th I took two eggs from it. Another nest also with two eggs was found on the same day, and subsequently, during July and August, other nests were found by me.

"Two appear to be invariably the number of eggs laid. They have little or no gloss; the ground-colour is pale greenish white, and this is nearly all covered with dashes of greyish ash, which run one into the other at the thick end and form a cap. In addition, the egg is sparingly marked with fine, round spots of dark brownish black running at the edges like inkspots on blotting-paper.

"All the nests I have met with have been placed in secondary jungle, on shrubs and bamboos, seldom more than four feet, occa-

sionally only two, and in one instance about six feet from the ground.

"The nest is generally pear-shaped, the upper part tapering up to the point of attachment. Occasionally the shape is more that of a long cylinder. The total length varies from 6 to 8 inches and it is 3 in its widest part. The entrance $1\frac{1}{2}$ by 1 is centrally situated, and is overhung by a rude porch, an inch wide and about $1\frac{1}{2}$ long. The walls are half an inch thick, but at the base fully an inch.

"The materials are chiefly fine grasses mixed up with scraps of dead leaves, moss, bark, and cobwebs. The interior is entirely of very fine grass, and the egg-chamber has usually a few feathers in it. Pieces of bark are suspended from the nest by cobwebs, occasionally extending a foot down."

And he subsequently added this note:—"This bird appears to breed twice a year, if not oftener. I had found numerous nests in July and August, but this year I got two nests in March, one with young birds on the 16th, and one with two fresh eggs on the 17th. In my former note I carelessly omitted to give the measurements of the eggs. In length they vary from 0.65 to 0.57, and in breadth from 0.48 to 0.41; the average of ten eggs is 0.6 by 0.45."

Mr. J. Darling, Junior, writes:—"I took this nest at Taraoar on the 12th February. It was hanging from the end of a thin bough of a large bush in open land, 10 feet from the ground. The nest was built of moss, cobwebs, and mixed with a great deal of some small brown seed, and some fine bark, like thin brown paper, lined with fine grass and some silk-cotton stuff, with a few feathers; the aperture $1\frac{1}{2}$ inches in diameter; length of nest 6 inches, diameter 3 inches; with a long tail hanging to it. The two eggs were so hard-set, that I broke one altogether; the shell of the other I send.

"I found another nest on March 1st, and shot the hen off the nest, which contained two fresh eggs. The nest was suspended from a twig of a bamboo put up for a pandal to grow pumpkins on, 10 feet from the ground; it was built of rotten bamboo-leaves, moss, cobwebs, and fibrous bark on the outside, cocoanut-fibre on the inside, and lined with fine feathers. The ornamentation consisted of a great many droppings of lizards bound with cobwebs. The nest was 6 inches long, 3 in diameter, with an aperture 1 inch in diameter; the wall $\frac{1}{2}$ inch thick all round, and 1 inch thick at bottom."

The eggs are rather elongated, more or less decidedly pyriform, much compressed towards the small end; the shell is extremely delicate and fragile, but dull and glossless; the ground-colour is a dull greenish white, and the greater part of the surface is mottled and clouded with pale dingy brown, which in some eggs has a faint purplish tinge. Besides this a very few spots and specks, almost black in colour, sometimes partially extended into short lines, are sparsely dotted about.

The few eggs I have measured vary from 0.56 to 0.63 in length, and from 0.41 to 0.48 in breadth.

Arachnechthra andamanica*, Hume. *The Andaman Sun-bird.***Cinnyris andamanica* (Hume), *Hume, Cat. no. 234* quat.**

Of the nidification of the Andaman Sun-bird, Capt. Wimberley writes:—"I send the nest and two eggs of *A. andamanica* taken by me on the 3rd March at Aberdeen, together with the female b.r.d. The nest was suspended from a creeper growing on a gurjun or wood-oil tree. It was built about five feet from the ground."

The nest is a typical Sun-bird structure, suspended from a very slender leafy twig, about 4 inches from its extreme point, these remaining 4 inches being allowed to hang down alongside the nest. The body of the nest is egg-shaped, the longer diameter being vertical, and the end nearest the point of suspension being drawn out into a point. At the lower extremity there is as usual a fringe of pendent ornaments, thin strips of bark, of two kinds, brown and silvery. The body of the nest is about 5 inches by 3, external diameters, the point is drawn up about an inch longer, and the fringe hangs down about two inches below the bottom of the true nest. About two inches below the point of suspension is a little portico, which projects about an inch and immediately overhangs the oval aperture, which is an inch or rather more wide and nearly two inches high. The greatest interior diameter is two inches, and it is only one and a half inch deep below the lower margin of the entrance. The nest is somewhat loosely woven with fine grass and vegetable fibre and a few dead leaves, and numerous pieces of red fern-roots, white silver-paper-like bark, and other similar vegetable odds and ends are incorporated in the outer surface. As usual the margin of the lower half of the entrance is more firmly woven, and the whole interior below the aperture is densely felted with soft satiny vegetable down, mingled white and brown.

The egg (for one was destroyed in transit) is a moderately elongated oval, a good deal pointed towards one end. The shell is fine but glossless. The ground-colour appears to be a slightly pinkish white, everywhere clouded and mottled with a faint wash of pinkish or purplish brown. Besides this a few dark brown, in some cases almost black, specks, mostly very minute, are scattered here and there about the surface of the egg. Only one of the specks exceeds in size a full stop as here printed. The clouding already alluded to seems to have a faint tendency to form a zone about the large end. Some of the dark spots are surrounded by a nimbus, as if the colour had run.

The egg measures 0·67 by 0·48.

Arachnechthra minima*, Sykes. *The Small Sun-bird.

Leptocoma minima (Sykes), *Jerd. B. Ind. i, p. 369; Hume, Rough Draft N. & E. no. 233.*

Mr. Davison tells me that "the Tiny Honey-sucker breeds on

the slopes of the Nilghiris in September and during the earlier part of October; I have seen young birds only just able to fly about the middle of October. The nest is suspended to a twig about 4 or 5 feet from the ground; it is similar, both in shape and materials, to that of *A. zeylonica*, but considerably smaller. They lay two eggs."

Mr. Frank Bourdillon writes from Travancore:—"This beautiful little bird is common on the edges of forest, and is slightly gregarious in habit, three or four hunting about together amongst the boughs of some gamboge-tree, which is a tree they seem particularly to like. They are not at all shy, and when sitting quiet in thick bushwood I have seen them perch inquisitively within a few feet of my face. I have not obtained the eggs of this species, but Mr. Ferguson observed a pair commence a hanging nest at the extreme end of a gamboge-bough at some height from the ground. Unfortunately the birds left the nest unfinished."

The eggs, which were taken by Mr. Davison, are perfect miniatures of some of the eggs of *Arachnechthra asiatica*. In shape they are a somewhat elongated oval, a good deal compressed towards one end. They have scarcely any gloss. The ground-colour is a dull greenish or greyish white, and it is thickly speckled and mottled all over, most thickly so towards the large end, where the spots have a tendency to become confluent and form a zone, with a dull greyish and olivaceous brown.

The eggs measure 0.62 by 0.42 inch.

Arachnechthra zeylonica (Linn.). *The Purple-rumped Sun-bird.*

Leptocoma zeylonica (Linn.), *Jerd. B. Ind.* i, p. 303; *Hume, Rough Draft N. & E.* no. 232.

The Purple-rumped Sun-bird lays at least twice a year, as I have found the eggs both in February and August, but the breeding-season is very variable, as will be seen by the notes which I quote further on, to which I may add that Mr. Davison saw a nest containing young birds in Captain Mitchell's verandah at Madras, late in December. A pair had built in the same place, he tells me, year after year, as is indeed, I believe, the habit of these Sun-birds.

The nests, which are generally attached to the terminal twigs of branches, at heights of from 10 to 30 feet from the ground, are most lovely little structures, hanging purses with the aperture near the top, and, as in *A. asiatica*, with a little projecting portico over the doorway. An average-sized nest will measure externally from top to bottom from 5 to 6 inches in length and about 3 inches in diameter. Internally from the lower edge of the entrance it will be about 2 inches deep and about 1½ inch in diameter. The entrance-hole is from an inch to 1½ inch in diameter. The body of the nest is generally chiefly composed of very fine grass or vegetable fibre. The egg-chamber very softly lined with feathers

or silky vegetable down, and the exterior profusely ornamented with tiny dry flower-buds, scraps of white lichen, dry white leaves, glistening straw, and anything else that happens to be handy, and that appears to have attracted the little bird's attention in any way. The nests are always hung to some slender twig, over which the upper surface of the nest is firmly worked with fibres and vegetable down. Sometimes long pendants of leaves, lichen, &c. hang down from the nest, making it much longer than I have above described.

Elsewhere, before I had seen as many nests as I now have, I thus described them:—

"The only two nests that I have seen of this species closely resemble those of *Arachnechthra asiatica*. They were in both cases suspended, the one from a babool, the other from a peepul tree. They were long and pear-shaped, with the thickest portion of the pear downwards. On one side, just at the swell, a cut had, as it were, been made, and the cut piece had been pulled up so as to form a sort of projecting portico over the entrance-hole. The total external length of the nest was about 6 inches. The greatest external diameter about $2\frac{1}{2}$ inches. The portico projected nearly 1 inch. The entrance-hole beneath it was oval, about $1\frac{1}{4}$ inch high and $\frac{3}{8}$ inch broad. Internally the nest was about $2\frac{1}{4}$ inches deep below the lower edge of the entrance aperture, and this lower edge, I may here mention, as in the case of the rim of the nests of the Palm-Swift, was very firmly corded and banded, if I may use such an expression, so as to prevent the possibility of the nest being split down at this place. The materials composing the nest were very various. The main fabric of the nest was a tow-like vegetable fibre firmly felted together, and with a good deal of cobweb intermingled. The whole interior of the nest below the level of the lower rim of the entrance aperture was densely felted with the beautiful glossy white down of the seeds of the *Asclepias gigantea*. Externally, apparently for the sake of ornament, or possibly to render the nest less conspicuous, all kinds of odds and ends, chips of wood, scraps of bark, dry petals of flowers, a little moss, and numerous tiny cocoons, were fastened on with cobwebs."

According to my experience, the eggs are invariably two in number. Captain Beavan (*vide infra*) says three, but he is talking of two nests, and I think he means that there were two in one and only one in the other nest.

Dr. Jerdon states that "it is exceedingly abundant in Madras, more so I think than in Lower Bengal. It may be seen in every garden flitting from flower to flower, and it builds a very neat nest of grass, vegetable fibres, spider's web sometimes, with a hole at the side near the top overshadowed by a canopy of the same materials, and lays usually two eggs of a pale greenish tinge, with small dusky spots."

Mr. Theobald, writing from Sooramungalum of the Salem District, tells me that August is the laying-season there. "The nests are suspended at a moderate height from the ground to the branches

of thorny acacias. They build a very neat little hanging nest, thick at the bottom and tapering towards the top, having a round hole for entrance $2\frac{3}{4}$ inches from the bottom; circumference at the thickest part $7\frac{1}{4}$ inches; length 6 inches. It has a prominence above the hole covering about half of it. It is made of vegetable fibres, cobwebs, and chips of dry wood, and lined with a beautiful soft kind of silk-cotton (from a milky bush of the *Asclepiadaceæ* family, I think it is the *Calotropis gigantea*) which the natives of Southern India call *verkum punjee*.

"I always found two eggs in the nests of these birds, and think that the young birds are male and female, for I invariably found one a little bigger than the other; the colour of the plumage in the young is the same. The natives also informed me that two eggs are the usual number, and that the young are always a pair."

Captain Beavan, writing from Maunbhoom, says:—"Two nests were brought to me on the 27th March, from which I take the following description:—Bottle-shaped; the entrance from one side near the top; its aperture circular, with a dome over it. Composed outside of bits of bark and fibres, firmly agglutinated with spider's web; the top of the nest attached firmly to a small twig, from which it hangs suspended, and exposed to every breeze, which must shake the nest severely and cause it to swing, but without damaging the eggs, owing to the peculiar elasticity of the silky webs employed. Extreme length of nest 6 inches; breadth $2\frac{5}{8}$ inches; aperture 1 inch in diameter; circumference just below the entrance $7\frac{5}{8}$ inches. The eggs were three in number, much elongated at the smaller end. Ground-colour dirty white, covered with minute ashy-brown specks, which combine so as to form a zone near the blunt end. Both nest and eggs very much like those of *Arachnechthra asiatica*; but the former may be distinguished by its slightly smaller size, and the eggs by the zone. The eggs of both species vary considerably in colour; and after a careful examination of fully forty nests and eggs of both species, I find it very difficult to discriminate between them, or draw an exact line of difference. The only way I could be certain of the identity was by having the females caught by birdlime at the entrance of the nest. From captures made in this way, I find that the male of this species takes part in incubation, a fact not observed in *A. asiatica*. Three of the eggs I obtained measured respectively $\cdot 65$, $\cdot 68$, and $\cdot 56$ inch in length; and in breadth $\cdot 43$, $\cdot 46$, and $\cdot 51$ inch. The young when fledged are like the female, but with brighter yellow on the breast."

Long ago Mr. Blyth, then at Calcutta, remarked:—"According to Mr. Walter Elliot, the present species 'builds a hanging nest with an entrance near the top, opening downwards,' and such is the form of a beautiful fabric before me, which I am assured is the production of this bird. It is attached, nearly throughout its length, to a small thorn twig, and is of an elongated pear-shape, composed chiefly of soft vegetable fibres, very densely and neatly interwoven; on the outside are some coarser strips of grass, leaves,

scalings of bark, &c.; but the substance and internal lining are constructed of the softest fibres only, which are reflected over the lower portion of the entrance, so as to fasten down its rim, imparting thus a neatness of finish to this part of the structure; above the floor of the entrance is an overhanging roof or canopy, formed by the lining of the upper third or more of the nest being made to project semicircularly over the orifice, and then finished externally like the rest, with coarser material and some bits of leaves and the like, to disguise the nature of the fabric."

Mr. F. R. Blewitt sends me the following note:—"I have met with this beautiful species only in the extensive forests of the Raipore and Sumbulpore Districts. It is to be met with in considerable numbers, either singly or in pairs; incessantly flitting from flower to flower, and from tree to tree. I have never seen it in gardens anywhere; it has a very feeble shrill kind of chirp, easily distinguishable from the louder chirp of *A. asiatica*. The bird breeds in February and March and probably part of April. On the 19th February, 1871, in the Raipore District, a nest, with two fresh eggs, was found suspended some 20 feet from the ground, from the end of a thin upper branch of a sal tree in open forest country. After many unsuccessful attempts it was eventually with great difficulty secured. A few days after another unfinished nest was discovered, similarly suspended. The nest is bottle-shaped, with a very moderate-sized neck, cleverly attached to the branch. The exterior is neatly made of fine grass, largely dotted over with small affixtures of vegetable fibres, spider's web, &c. The interior is carefully lined with soft seed-down; the entrance-hole is about midway. The nest first found lacked the canopy described by Dr. Jerdon. Constructed at a great height from the ground and cleverly disguised, it is very difficult to detect the small nest of this Sun-bird."

Mr. B. Aitken sends me the following interesting note:—"This is the common Sun-bird of Bombay. In Poona and Berar it is not so often seen as *Arachnothera asiatica*. It is very familiar, building in every garden, and quite regardless of observation. I have several times seen the nest not more than eight feet from the ground. Few birds leave the nest so early as this species. For days after they are fledged they are so helpless as easily to be caught by the hand, and many fall a prey to Crows. I have no doubt whatever that they have two broods between June and November, but a nest may also occasionally be found in the hot weather. The covered porch over the nest is not invariable. With reference to Mr. Theobald's note in your 'Rough Draft,' that he always found one young bird larger than the other, I may mention that on the 25th March, 1871, I found a nest at Poona which contained a young bird that I judged to be three days old, and an egg ready to be hatched. I am surprised that neither you nor your correspondents seem to have noticed that one of the two eggs is nearly always addled. According to my experience both eggs are seldom hatched. I have found old deserted nests with

a dried-up egg in them; I have found one young bird and one addled egg together; and I have never seen more than a single young one following the parent bird; but, excluding the case at Poona, just mentioned, I have found only one nest with two young ones in it, and that was at Bombay in 1859. The time was the first week in April, and the young birds were fully feathered, almost ready to fly. I have not known the birds return to a nest that had been robbed."

Mr. Rhodes W. Morgan, writing from South India, says:—"This little Sun-bird breeds all over the plains of Southern India. The bird often selects a cobweb in which to build its nest; and this is so ingeniously built that it is impossible to detect the existence of the nest unless the cobweb is examined. The eggs are two in number, and of a pale greenish white, minutely speckled with dusky grey. Dimensions, 0.62 in length by 0.46 in breadth."

Messrs. Davidson and Wenden write:—"Found all over the Deccan. Commoner in the well-watered parts, and breeds."

Mr. G. Vidal remarks of this bird in the Konkan:—"Common and generally distributed. Nests found with eggs in January, March, April, and September."

In shape, size, and colouring the eggs bear the closest resemblance to those of *Arachnechthra asiatica*. They are moderately broad oval eggs, sometimes, however, a good deal elongated, and usually a good deal pointed towards one end; the shell is delicate and close-grained, but almost entirely devoid of gloss; the ground-colour varies much. In some it is nearly pure white, but generally it is a dingy greenish or brownish white, much freckled, clouded, and streaked with minute greyish-brown or brown markings, which commonly form an irregular zone round the larger end and sometimes form a confluent cap. In some eggs the whole of the rest of the surface beyond the zone or cap is devoid, or almost devoid, of markings. In others the whole surface of the egg is so closely speckled all over as almost entirely to conceal the ground-colour; the variations in these respects reminding one much of similar variations in the eggs of many species of Larks.

A pair of the eggs of this species, taken at Gopalpur in the Deccan on the 6th August, 1877, by Mr. Davidson, are in colour dingy greenish white, powdered all over with fine greyish-brown specks, which combine at the large end in forming in one egg a dense confluent cap and in the other a dense confluent zone. Round the zone there is also an occasional streak of black.

The eggs vary in length from 0.6 to 0.7 inch, and in breadth from 0.43 to 0.49 inch, but the average is 0.65 by 0.47 inch.

Subfamily ARACHNOTHERINÆ.

Arachnothera magna (Hodgs.). *The Larger Streaked Spider-hunter.*

Arachnothera magna (Hodgs.), *Jerd. B. Ind.* i, p. 360; *Hume, Cat.* no. 223.

From Sikhim Mr. Gammie writes:—"Common as the large Spider-hunter is on the Cinchona reserves, I have as yet taken but two nests of it. As they were precisely alike, both in structure and position, and also, as I am informed on good authority, that the nests of this bird are always similar to those I took, I can but conclude that Jerdon had neither seen one *in situ* nor even a perfect specimen, else he would never have described it as a 'very large but loose structure of grass and other fibrous materials, with a hole at one side near the top.' In the first place, the nests measure, externally, 4 inches in height by the same in diameter at the top, and consequently are not 'very large' for the size of the bird; in the next place, the fibrous materials, fine grass-stems and skeletonized leaves, of which they are composed, are compactly and neatly interwoven; and the nests are cup-shaped, with an open top instead of having the hole at one side. The Spider-hunter builds so neat a nest, in so beautiful a situation, that, with a fresh nest before him, the greatest admirer of Jerdon could not help abusing him for so grossly misrepresenting this most elegant builder. The nest is suspended from about the middle of a large plantain-leaf by numerous threads (two hundred or so) of plantain-stem fibre, attached to rather more than half the rim of the cup, put through the blade of the leaf and knotted on the upper side. The holes are as neat—not a crack from them—as if they had been bored with a sharp needle, and as they are but barely large enough for the insertion of the threads, not a trace of water can get through to the nest. So comfortable did both the nest itself and its position appear to me the first time I saw it, which was on a pouring wet day, that I could not help wishing I had been born a Spider-hunter. The cavity is lined with fine grass-stems, and measures about 2·5 inches in diameter by the same in depth. The full number of eggs appears to be three. Both my nests were found in May, at about 3000 feet; but as the bird is very common up to at least 5000 feet, I have no doubt it breeds up to that elevation."

He subsequently adds that the breeding-season extends to August, and that the number of eggs laid in one nest is almost invariably three.

The eggs obtained by Mr. Gammie correspond with one previously sent me by Mr. Mandelli, and with some received from Tenasserim. They are distinctly of the *Arachnothera* type, but much darker, and of course much larger. They are moderately elongated ovals, considerably pointed and compressed towards the

small end, have a fine compact shell, and a very fair amount of gloss. The ground is a drab or sepia-brown, with, in one, a decided purplish tinge, and they are minutely striped and speckled sometimes all over, but even then most densely about the large end, and sometimes there only, with a deep dingy purple which is almost black.

In length they vary from 0·85 to 1·05, and in breadth from 0·61 to 0·75. As will be seen from these dimensions, the eggs vary immensely in size.

Chalcoparia phœnicotis * (Temm.). *The Ruby-Cheek.*

Chalcoparia singulensis (Gm.), *Hume, Cat.* no. 233 sex.

Mr. Oates records the following note on the nidification of this bird in Pegu :—

"This bird appears to nidificate from the middle of May to about the end of July. On the 3rd June I found a nest with two eggs nearly hatched. It was suspended from a branch of a mango tree about 20 feet from the ground, and well surrounded by leaves. On the 25th June another nest was found from which the young had apparently just flown. It was about 8 feet from the ground. On July 6th a nest with two nearly fresh eggs was discovered hanging on a shrub about 4 feet high, and on the 8th of the same month another quite completed, but with no eggs. It was attached to the extreme tip of a bamboo about 25 feet from the ground.

"The eggs appear to be always two in number. Three eggs measure ·66, ·64, and ·63 in length, by ·46, ·43, and ·44 in breadth, respectively. They have little or no gloss. The ground-colour is pinkish white, and the whole shell is thickly streaked and otherwise marked with brown, in which a purplish tinge is distinctly visible. The marks are very evenly distributed, but round the thicker end they tend to coalesce and form a more or less distinct ring. Very little of the ground-colour is visible.

"The nest is a very lovely structure, closely resembling that of *Floceus baya* in shape, with the tube cut off at the level of the bottom of the nest. At a short distance off, it looks like a mass of hair-combings. Three nests are composed throughout of black

* I have shown in my work on the Birds of India that this species does not belong to the *Nectarinidae*. Its proper position is probably among the *Idestri- chidae*.—Ed.

hair-like fibres very closely woven. With these are intermingled numerous small cocoons, pieces of bark, a few twigs here and there, and large lumps of the *excreta* of caterpillars. The interior is sparingly lined with fine grass. A fourth nest was made almost entirely of strips of grass, a very small quantity only of black fibres being used. Some huge pieces of bark, nearly as large as the bird itself, were suspended by cobwebs from the lower part of the nest.

"The nest is pear-shaped, about 6 inches in height, and barely 3 inches outside diameter at the thickest part. The upper 2 inches are solid. The entrance is about halfway down and measures $1\frac{1}{2}$ by 1. The bottom of the egg-chamber is about one inch below the tip of the entrance, and the thickness of the walls everywhere is about one third of an inch. The wonderful part of the nest is the verandah or portico. This springs from the upper edge of the entrance and extends to two or three inches below the bottom of the nest. Laterally it extends to rather more than the width of the nest, and the sides are incorporated with the main structure all the way down. It is made of the same materials as the other portions, is about a quarter of an inch thick, and very strongly woven and elastic."

The only egg of this species that I have yet seen, sent me by Mr. Oates, was a very elongated, slightly pyriform oval in shape. The shell was very fine and fragile, but entirely devoid of gloss. The ground-colour was a dull white or whitish stone-colour; the whole egg was extremely thickly freckled, mottled, and streaked with a dull greyish purple, so thickly that at the large end the markings are absolutely confluent, while even towards the small end but little of the ground-colour is visible.

Two other eggs are rather elongated ovals, and very dull and glossless in appearance. The ground-colour is a sort of creamy stone-colour, and the entire egg is thickly but very finely freckled over with pale greyish purple, which freckling becomes confluent and much more conspicuous in a rather narrow zone round the large end.

Family DICÆIDÆ.

Dicæum cruentatum (Linn.). *The Scarlet-backed Flower-pecker.*

Dicæum coccineum (Scop.), *Jerd. B. Ind. i.*, p. 373.

Dicæum cruentatum (Linn.), *Hume, Rough Draft N. & E.* no. 236.

Mr. Oates, writing from Pegu, says:—"I have taken many nests of this bird from the 2nd March to the 9th April. The

number of eggs laid is either two or three, just as often one as the other. The eggs are pure white without any gloss, and are rather pointed at one end. They vary in size from $\cdot 58$ to $\cdot 55$ in length, and from $\cdot 42$ to $\cdot 38$ in breadth.

"The nest is generally built in mango-trees, but other trees, especially if the leaves are large and drooping, are also used. It is placed at all heights from the ground, from twelve feet to the summits of the highest trees. The nest is suspended from an outside twig, and is so surrounded by leaves that it is almost invisible. When once the female begins to set, all efforts to find the nest would, I believe, be useless. It is only by watching the little birds carrying materials, which they do incessantly and with a constant twitter, that I and my shikaree have been able to secure the nests.

"To say that the nest is most beautiful is only to say what is applicable to the nests of all the Flower-peckers. The nest of this little bird is simply exquisite when newly built. It measures no more than 4 inches in total height, and one nest I have is only $3\frac{1}{2}$ inches. It is egg-shaped, slightly pointed at the upper end, where it is attached to the branch. Its external diameter is 2 inches. The entrance is circular, $\frac{3}{4}$ inch diameter, and placed just midway between the top and bottom of the nest. The egg-chamber is small, the walls of the nest being of considerable thickness.

"The bulk of the nest is made of the finest vegetable down of dazzling whiteness resembling spun glass; and exteriorly the nest is kept firm by being bound round with fine grass, which is twisted into a rope at the lower edge of the entrance. At the back of one nest there are a few patches of *excreta* of caterpillars, and in another, four dry blossoms of some shrub are stuck to the back of the nest. As a rule, however, no ornamentation is attempted."

Mr. J. R. Cripps writes:—"This tiny species is very common in the Dibrugarh district in forests and cultivation, and common in tea-gardens, when they are in bloom. On the 24th May, 1881, I found a nest with three hard-set eggs. The nest was in a guava-tree growing in a ryot's compound, and was suspended from a twig about as thick as a pencil and 5 feet off the ground. In shape it was like an egg, the short end hanging downwards, and measured $2\frac{1}{2}$ inches long by 2 broad, with the entrance at the upper side, and was composed of very fine black threads, evidently spiders' webs, and lined with the cotton of the pod of 'Semul' (*Bombax*, sp.)."

Dicaeum trigonostigma (Scop.). *The Orange-bellied Flower-pecker.*

Dicaeum trigonostigma (Scop.), *Hume, Cat. no. 236 bis.*

The eggs * are regular ovals, moderately elongated, the shell very fragile and entirely glossless. The colour pure white. Our specimens, contrary to what was to be expected in this genus, exhibit a very few excessively minute dark specks, which are brown or reddish brown, but which, even with a magnifying-glass, we cannot make certain as to whether they are natural or have been subsequently made by insects. Two eggs measured 0.6 by 0.41 and 0.43 respectively.

Dicaeum ignipectus (Hodgs.). *The Fire-breasted Flower-pecker.*

Myzanthus ignipectus, *Hodgs., Jerd. B. Ind. i, p. 377; Hume, Rough Draft N. & E. no. 241.*

Mr. R. Thompson tells me that the Fire-breasted Flower-pecker "breeds regularly at and about Nynsee Tal, laying in June and July. It constructs a pendent nest, which it attaches to the bare bough of some large tree. In shape the nest is a sort of purse, opening at the side towards its upper extremity. The nest is like thin felt, and is composed of the pubescent covering of the stems of various species of *Loranthus*, or misseitoes. I never examined the eggs."

According to Mr. Hodgson's notes and figures, this species lays in April and May. They build, in groves or open forest, a hanging nest, rarely above a couple of feet from the ground. The nest is attached to the end of some leafy spray which is incorporated in its substance. In shape it is pyriform, some 5.75 inches in length by 2.75 in width; the entrance, which is about 2 inches below the point of suspension, is circular and about 1 inch in diameter. The nest is chiefly composed of green moss and hair-like roots, and is lined with soft grass and grass-flowers. Two or three eggs (which, however, are neither figured nor described) are said to be the maximum number laid, and both sexes are said to participate in the work of incubation and rearing the young.

Dicaeum concolor, *Jerd. The Nilgiri Flower-pecker.*

Dicaeum concolor, *Jerd.; Jerd. B. Ind. i, p. 375; Hume, Rough Draft N. & E. no. 230.*

I have never myself obtained the eggs and nests of the Nilgiri Flower-pecker, but have had many of these sent me. The first nest I obtained I described elsewhere, thus:—

* Mr. Hume appears to have received the eggs of this species from some correspondent. I cannot, however, find any note about the breeding of this bird within Indian limits either among his papers or in any published work.—
Ed.

"The nest of this species is a beautiful little purse, hung from the branch of some shrub, loosely woven exteriorly with fine grass and warmly lined with the silky pappus of some asteraceous plant. In the exterior framework of the nest small fragments of fine moss and down of plants, similar to that so largely used by *Piprisoma agile*, are intermingled. The total exterior length of the nest from the point of suspension to the bottom is about 8 inches, and the exterior diameter about 2 inches. The entrance, which is circular and just below the point of suspension, may be about $\frac{3}{4}$ inch in diameter, the cavity extends for about $1\frac{1}{4}$ to $1\frac{1}{2}$ inch below the lower margin of the opening, and is perhaps between $1\frac{1}{4}$ and $1\frac{1}{2}$ inch in diameter." Subsequently I saw many other nests, and recorded the following note:—

"The nests of the Nilghiri Flower-pecker are regular purses, comparatively large for the size of the bird, reminding one much of those of *Piprisoma agile*. They are hung like those of the *Arachnechthra*'s from a slender twig, but whereas the apertures in the Honey-suckers' are in the sides or parallel to the suspending twig, the entrance in the Flower-peckers' is in front, or at right angles to the twig. They are lined with the finest and silkiest vegetable down, and externally the nest is composed of vegetable fibres, lichen, little pieces of grass, portions of leaves, and some little cobwebs; lining and all included, they are scarcely anywhere more than $\frac{3}{4}$ inch in thickness. They vary a great deal in size externally; some are at least 4 inches deep, measured from the bottom of the nest to the top of the suspending twig; others are not above 3 inches. Internally the cavity, measured from the lower edge of the orifice, is from $1\frac{1}{2}$ to $1\frac{3}{4}$ inch in depth, and the internal diameter varies from little more than 1 inch to nearly 2 inches."

The Nilghiri Flower-pecker breeds from January to April and lays three eggs.

Mr. Davison notes the following in regard to the nidification of this species:—"This little bird, so abundant on the Nilghiris, breeds at Ootacamund and its vicinity during the latter end of February and March. The nest is suspended to a small twig; it is pear-shaped, composed externally of cotton, bits of moss, a few odd feathers, and the pappus of asteraceous plants, closely and compactly put together; on the inside it is thickly felted with this pappus or other soft substance mixed with feathers; the entrance is on one side near the top, circular, and with a slightly projecting canopy over it. In size the nest is a little smaller than that of *Arachnechthra asiatica*, and very similar to it in shape, but is a very much neater and more compact structure, and is never composed of the same coarse substances used by *Arachnechthra asiatica*, to wit, straw, bits of bark, &c.

"Usually some bushy large-leaved tree is selected, and the nest suspended to a slender twig far out on one of the branches, and well screened by the overhanging leaves. When a situation like the above is chosen, the nest is usually only from 10 to 15 feet

from the ground ; but I have known them to build in the slender-leaved *Acacia* (*Acacia melanoxylon*), and then the nest is seldom placed lower than 35 or 40 feet from the ground, and is placed where the foliage is thickest. I have always found three pure white eggs."

Miss Cockburn, writing from Kotagherry near Ootacamund, remarks :—

"Dr. Jerdon appears not to have known anything of its nidification. I have been fortunate in getting its nest and eggs, which, I am sure, could not have been found if the bird had not been seen with a white feather in its bill and watched till it flew to its nest, which was built at the extremity of a high slender branch of an Australian tree. The nest was at the measured height of 34 feet from the ground and extremely difficult to reach, but, as it was rare, every effort was made to approach it, and they were successful. The Nilghiri Flower-pecker builds a *very* neat hanging nest, 3 inches in length, and the opening at the side towards the top. The materials used are fine long grass, green moss, and cobweb. The inside warmly lined with a quantity of the down of seed-pods and feathers. The nest alluded to above was found in the month of January, and contained two very small pure white eggs."

Mr. Rhodes W. Morgan, writing from South India to 'The Ibis,' says :—"This little bird breeds in March, building a beautiful little pendulous nest at the extreme end of a small twig, some 20 or 30 feet from the ground. The tree usually chosen in the cantonment at Ootacamund, on the Nilgiris, is the *Acacia melanoxylon*. The nest is built of the silky down of some tree, and bound together with very fine fibres. The entrance is at the side. The eggs are beautifully white and fragile-looking, usually two in number. Measurements of one in my collection are as follows :—·7 inch in length by ·45 in breadth. Owing to the great height at which these birds build, large numbers of their nests are torn off and blown down if the weather becomes at all windy."

The eggs of this species, which I owe to Miss Cockburn and Mr. Davison, are elongated ovals, pure white and glossless, for all the world like little sugarplums.

The eggs vary in length from 0·6 to 0·68 inch, and in breadth from 0·4 to 0·46 inch.

Dicæum erythrorhynchum (Lath.). *Tickell's Flower-pecker*.

Dicæum minimum (Tick.), *Jerd. B. Ind. i*, p. 374; *Hume, Rough Draft N. & E.* no. 288.

The late Captain Beavan, so far as I know, was the first person certainly to take the nest of Tickell's Flower-pecker. He says :—"The first nest was brought to me at Beerachales on the 16th March, with three pure white eggs, which measured 0·6 inch by 0·4 inch. The nest is much like that of *Arachnothera asiatica*,

and of the same description, being suspended by spider's web from a bough; but it is a good deal smaller, rather less oval and more round, and the inside more carefully constructed. It is lined with the softest materials, so as to put me much in mind of the cocoon of the tusseh silkworm (*Antheraea paphia*)—it was so smooth and well made. In length it was 3·5 inches; in breadth 2 inches; and the circumference 7 inches. Several nests with young ones fully fledged were brought to me about the beginning of April."

Since the above was written, Mr. B. Aitken has favoured me with the following:—"I send a nest and specimens of *Dioxum minimum*, one of the commonest birds about Bombay and Poona. Its favourite food is the ripe berry of the common parasite *Loranthus longiflorus*. Indeed the bird is so plentiful that one or two can be seen at any time wherever there is a bunch of the parasite growing.

"The nest was taken from a mango-tree in Poona, at a height of about 10 feet from the ground, on the 5th April. It was beautifully placed under a cluster of leaves which hung round it on every side. It contained one white egg, smaller than that of the *Arachnechthra asiatica*. Unfortunately, I placed the egg on the wall out of the reach of rats, but within reach of a wretched gecko (house lizard), which destroyed it the first night."

The nest is a beautiful little egg, suspended by the pointed end (which is slightly, and only slightly, extended) from the point of junction of three slender twigs. The length of the nest (exteriorly) is exactly 3 inches, the greatest breadth 1·7 inch. In front, from close to the point of suspension to near the middle of the nest, is an oval aperture, 1·25 inch in length and nearly 1 inch in breadth. The whole nest is composed of the silky pappus of some asteraceous plant, or, it may be, of the silky down of the *Calotropis*, held together by a slender irregular web-work of vegetable fibres, in which here and there a very few minute fragments of the excreta of caterpillars and tiny pieces of bark and fine grass-stem have been, perhaps accidentally (for they are few and far between), intermingled. The nest varies from 0·25 to 0·4 inch in thickness; the thickest portion is just below the lower margin of the aperture, where a great deal more vegetable fibre is used than in any other part, clearly to obviate any danger of the nest being torn at this spot, where the strain on it of the birds going in and out would always be greatest. The whole interior is soft, silky, felted down.

Mr. J. Davidson, writing of Western Khandesh, says:—"A nest just finished was found by me at Pimpalnir in the beginning of February."

Capt. E. A. Butler writes:—

"Belgaum, 20th May, 1879.—I found a nest of Tickell's Flower-pecker. It was in structure, as far as I could see, exactly similar in shape to the nest of *Arachnechthra asiatica*, but without any portico, and densely lined with some soft silky white vegetable down, and the bird was sitting with her head looking out of the

entrance. The leaf to which it was attached was on the very top of a ' *Chumpu* ' tree about 14 feet from the ground.

"I went the following day to take the nest, and to my disgust found it gone; what could have taken it I cannot imagine.

" *Belgaum*, 7th April, 1880.—Found a nest containing two tiny slightly incubated pure white eggs, of an elongated form, and much narrower at the small end than the other.

"The nest was suspended from a small outside branch of a low tree, about 15 feet from the ground, the foliage of which was something similar to a banian but darker, and it was neatly concealed by the surrounding leaves.

"It was small, pyriform, and exquisitely built, with an entrance near the top on one side, and composed almost exclusively of the white silk-cotton from the seed-pod of *Bombax malabaricum*, with a thin coating or network of fine dry grass to keep it together, the cotton projecting above the entrance so as to form a slight portico. A few days later, notwithstanding that I had shot one of the parent birds, the survivor paired off with another mate, and built a new nest exactly similar to the first on another branch of the same tree, about 4 feet from the first nest. Strange to say, although I watched this nest closely after it appeared to be finished, I never saw the old bird sitting; and thinking that the birds had forsaken it, I sent a boy up the tree to look into it, and he reported it empty. About a week later, on the 4th May, seeing the old bird fly to the nest, I sent the boy up again, when to my great disappointment he reported that there were young ones (two), so that I lost the chance of getting the eggs from this nest."

The late Capt. C. R. Cock wrote to me some years ago:—"I have now taken four nests with eggs of this species besides several nests containing young, and I find that the usual number of eggs laid is three, that they are generally laid in March, and that at Sitapur, Oudh, the nest is invariably placed in a mango-tree, often under a thick cluster of leaves, at varying heights from the ground. One I found was at the top of a middle-sized tree, another was on a level with my face while riding. The nests are constructed of fine vegetable fibres externally covered with cobwebs, loose pieces of bark, dead shavings, and caterpillar excreta, this latter ornament being found upon every nest I have examined. The interiors are lined with little bits of cotton-wool, a few long hairs and pieces of worsted thread. The shape was much the same as that of *Piprisoma agile*, but larger from not being of such compact material, and differing in that it was suspended from the stalks of three or four leaves, while that of *Piprisoma* is always on a single twig.

"The nest is generally high up and placed under a thick bunch of leaves to hide it from that pirate *Dendrocitta rufa*, but not always successfully, as I have found to my sad experience. I may here remark that I wage war with *D. rufa* and do not tolerate them in my favourite baghs and topos, for many are the good eggs they have deprived me of."

The eggs taken by Captain Cock, some of which were sent me

by Capt. C. H. T. Marshall, are very similar to those of *D. concolor*, but somewhat smaller. They are rather elongated ovals, pure white and glossless, and they vary in length from 0.54 to 0.62, and in breadth from 0.4 to 0.42. The average of eight eggs is 0.58 by somewhat less than 0.41.

Piprisoma squalidum (Burt.). *The Thick-billed
Flower-pecker.*

Piprisoma agile (Tick.), *Jerd. B. Ind.* i, p. 370; *Hume, Rough Draft N. & E.* no. 240.

The Thick-billed Flower-pecker lays from the middle of February to the end of May, according to locality, breeding earlier in the plains and later in the Himalayas.

The nests vary greatly in material, but very little in size or shape. They are invariably—let the material be what it may—small, rather full-bottomed, purse-like bags, hung from a small twig as nearly horizontal as possible, and with the aperture with its major axis in the same plane as the twig to which the nest is suspended and immediately below the twig. The total length of the nest, measured from the upper surface of the twig to the bottom of the nest, is from $3\frac{1}{2}$ to $3\frac{3}{4}$ inches. The breadth of the nest at the point of suspension is about $\frac{1}{2}$ inch, and the lower baggy portion of the nest is about 2 inches in diameter. The depth of the nest exteriorly below the lower edge of the entrance-aperture is about $1\frac{1}{2}$ inch. Typically the nest is, as described by Captain Beavan and figured by Wolf, a felt-like pliable fabric composed of fibres, and the down taken from young shoots and flower-buds of various plants, specially from the *Butea frondosa* and our two common Indian *Loranthi*. The thickness of the fabric for the first inch below the twig scarcely exceeds in this kind of nest $\frac{1}{8}$ inch, but it thickens gradually, so that at the bottom it is fully $\frac{3}{8}$ inch thick. The fabric is soft and pliable, so that one nest before me, taken more than six months ago, may even now be rolled up without injury. This, however, is not the only type of nest constructed by this species. It sometimes makes a nest of the same shape and dimensions, it is true, but of widely different materials. In these cases the exterior skin of the nest, if I may so term it, is a very loose network of very fine tow-like fibres, backed internally throughout by a thick felting of the soft silky pappus or seed-down apparently of some asteraceous plant. One such nest I myself obtained with three young ones and both parents in the valley of the Sutledge below Kotgurih towards the end of May, so that there is no mistake about the matter. The nest in this case was about 5 feet from the ground, and hung in a small thorny bush, a kind of *Crataegus*, I think.

Writing from the Kumaon Terai, Mr. B. Thompson says:—"I obtained a nest of this bird at Ramnuggur, on the borders of the

Sub-Himalayan Range, on 12th May, which contained two eggs of a fleshy-white colour, thickly blotched with pinkish spots.

"The nest was a neat structure pendent from a thin branch of a small leafless tree. It was entirely composed of the pubescent covering of the skins of a species of *Loranthus* which the birds had scraped off, and mixing with spiders' webs had woven into a thin felt. The shape of the nest was that of a purse opening down the side."

Later, writing from Mirzapoor, he says:—"March 6th: shot several males, no females; these latter must be sitting, but in Kumaon they never commence breeding until the end of April. Agrore, 8th March: I was perfectly correct in my surmise that these birds were now breeding. This morning I took a nest, containing two newly hatched young ones, with my own hands. I observed the old birds coming and going, and appearing suspiciously anxious of the presence of a Shrike (*Lanius erythronotus*) which was hanging about, and this led me to search for the nest. It was on a leafless (deciduous) bush of the *Kutber* (*Zizyphus kulber*) about 10 feet from the ground. The old birds hovered about whilst I was taking it, and more than once perched close over my head. Chopun, 17th March, 1869: found three nests, two with very young birds in them, not fledged, so had not the heart to take them. There were two young ones in each; took the third nest, which was empty and torn. The young, no doubt, had been eaten by a Shrike or Crow. 19th March, Modahpore: to-day saw a couple fixing the foundation of their nest with cobwebs and the pubescent downy covering of the young shoots of *Butea frondosa*, which the birds bit off in small pieces and mixed with cobwebs; both birds at work, alternating the time of arrival and departure with material.

"The nests seen on 17th at Chopun were hung on the following kinds of trees:—

"1st, *Conocarpus latifolia*, was 14 feet from ground; 2nd, *Zizyphus kudber*, was 12 feet from ground; 3rd, *Conocarpus latifolia*, 9 feet from ground.

"The one seen to-day at 6 feet from ground on a twig of *Zizyphus kudber*."

Captain Beavan, who took several nests in Maunbhoon, one of which was figured in 'The Ibis,' tells us:—"The first nest was brought to me on the 26th March, with only two eggs, the usual number being three. The nest is very peculiar, a pocket-like structure suspended from a small bough, which forms the roof, the entrance being from one side near the top. It is composed entirely of spiders' web and other silks, with which a pinkish-brown fluff (probably from some tree in flower) is felted together, making the nest look entirely of that colour. There is no lining, only the material employed is denser at the bottom than at the top of the nest. The great peculiarity is, that the nest is as if woven in one piece, and, like a bit of cloth, can be shaken or compressed without doing it any injury. The length is 3 inches, breadth 2 inches,

entrance-hole 1·5 inch long by ·87 inch broad. The eggs are moderately elongated, of a light pink ground-colour, blotched indistinctly with pink spots, more frequent and massed at the obtuse end. They are large for the size of the bird, their length being 0·62 inch, and their breadth a little over 0·37 inch."

Two or three eggs are laid each time, the bird having, I am inclined to believe, two broods at least in the year.

The eggs vary a good deal in size and shape, as well as in colour. Typically they are rather elongated ovals, but comparatively spherical and somewhat pyriform examples occur. The ground-colour varies from white just tinged with rose to a decided pink, and the markings from brownish pink to claret-colour. The markings, again, are comparatively large spots, at others mere specks; in some eggs are sparse, in others thickly studded, in all are most numerous towards the large end, where they sometimes form an irregular zone or cap, and in some are almost confined to this part of the egg.

The eggs vary in length from 0·6 to 0·69 inch, and from 0·43 to 0·47 inch, but the average is about 0·63 by 0·45.

Pachyglossa melanoxantha (Hodgs.). *The Yellow-bellied Flower-pecker.*

Pachyglossa melanoxantha, Hodgs., *Jerd. B. Ind.* i, p. 378; *Hume, Rough Draft N. & E.* no. 242.

Dr. Jerdon says:—"This curious little bird (the Yellow-bellied Flower-pecker) has hitherto only been found in Nepal. Hodgson says that it feeds on small insects and viscid berries, and makes an ingenious pendulous nest, like *Myzanthæ*. I was not fortunate enough to procure this bird in Sikkim." I have been able to trace nothing about its nidification myself in Mr. Hodgson's notes or drawings.

Family PITTIDÆ.

Anthocincla phayrii, Blyth. *Phayre's Pitta.*

Anthocincla phayrii, Blyth, *Hume, Cat.* no. 346 ter.

Major C. T. Bingham was fortunate enough to discover the nest of this rare Pitta in Tenasserim. He says:—"Right up among hills, and in dense evergreen forest, the Meplay, the largest tributary of the Thoungyeen, takes its rise. Up at its source, where it is a mere bubbling rivulet, lies the small Karen hamlet of Hporrhai. On the 21st April this year (1881) I pitched my camp there, and in the evening strolled round with my gun. On the side of a deep bank covered by dense evergreen bushes I saw

something moving, which I first took to be a rat, but presently made out to be a Pitta of some kind scratching among the leaves. Breathlessly waiting with gun at full cock, I watched the bird for full ten minutes. At last it came well in sight, and I recognized it as a male of the above species. I hastily raised my gun and fired, knocking the bird over, and to my astonishment flushed a second, which, by the hasty glance I got of it, I thought was a female, wanting the black about the head. As I picked up the dead bird it flashed on me that these were a pair, and that there might be a nest, and sure enough a little search showed me a compact little oven-shaped nest, made on the ground at the foot of a tree, of leaves, roots, and grass, and containing four eggs. The entrance to the nest was at the side looking down the steep slope on which it was built, and having a firm little platform of twigs leading up to it. The interior of the nest was lined with fine black roots. The eggs are glossy white, spotted chiefly at the larger end with purplish black. They measure 1.10×0.88 , 1.08×0.85 , 1.09×0.85 , and 1.10×0.86 . I may add that I did not take eggs, or disturb the nest there and then, but waited till the following morning, hoping to secure the female; I was disappointed, however, the eggs were quite cold, and the nest had evidently been deserted. Work obliged me to shift camp that day. I tried to remove the nest, but, notwithstanding the utmost care, it tumbled to pieces."

The eggs of this species, to my mind, fully establish what I have always contended, namely, that it is one of the Pittidæ. No one seeing the eggs of *Pitta nepalensis*, *P. brachyura*, *P. cyanoptera*, *P. cyanea*, *P. cucullata*, and *P. megarhyncha*, could then, on seeing the eggs of this species, doubt that they all belong to the same subgroup. The general character of the egg is the same glossy china-white ground, speckled and spotted with a more or less inky purple, becoming blackish in spots. But nevertheless the eggs have a character of their own, and, though much smaller, most closely resemble those of *P. nepalensis*. In shape they are broad ovals, but they are rather more pointed towards the small end than are those of any of the species above referred to, and the markings are more speckly and spotty, scarcely showing any of the peculiar angular hieroglyphic-like lines and scratches so common in the eggs of *P. cucullata*, *P. cyanoptera*, and *P. cyanea*.

In this respect they more resemble *P. brachyura* and *P. nepalensis*, but the markings, the spots I mean, run decidedly smaller than in the eggs of those two species, and are almost all of the dark colour well marked, and very few of them of the pale washed-out lilac-grey. They are decidedly blacker too, and show scarcely any of the reddish-purple tinge that characterizes so many of the spots of those species.

Pitta nepalensis (Hodgs.). *The Blue-naped Pitta.*

Hydornis nipalensis, *Hodgs., Jerd. B. Ind. i, p. 502; Hume, Rough Draft N. & E. no. 344.*

I myself obtained an egg of the Blue-naped Pitta at Darjeeling, on the 19th May, 1872, from a place about 4000 feet high below Lebong. The nest was a mass of grass and leaves placed on the ground at the roots of a bush. The old bird was caught by the hand on the nest, and proved to be the female. The nest contained three hard-set eggs, of which I only succeeded in preserving two in a very shattered condition; in fact, the young were ready to hatch off. These two eggs measure 1·2 inch by 0·97 inch, and 1·3 inch by 1 inch. They are consequently very broad oval eggs with a very glossy white ground, like white china, somewhat thinly spotted and speckled with pale inky purple and purplish maroon.

From Sikkim, Mr. Gammie writes:—"This species breeds about the end of May and during June. I took two nests of it in the Government Cinchona reserves, at 5000 feet above the sea, on the 10th June, one containing three, and the other four hard-set eggs. Both were among dense scrub, and placed, about 5 feet from the ground, on almost level platforms formed by several leafy branches being bent down, one on the top of the other (naturally, not by the bird) to a horizontal position. The larger of these tables was about 4 feet square, and the smaller half that size. A considerable quantity of large leaves and rotten sticks had first been collected in a heap near the middle of the table, and afterwards the nest built on this heap. The nest was hooded, with entrance at side, and measured externally (exclusive of foundation-heap) 7·75 inches in height by 9 inches in breadth; internally the cavity measured 5·5 inches in diameter by about 1 inch in depth from lower edge of entrance, which was 3·75 inches in diameter. The nest was made of fern-fronds, bamboo and other leaves, and lined on the top and sides with dry bamboo-leaves and in the bottom with black fibry roots. The materials were so very rotten, and so loosely put together, that the nest would scarcely bear handling, but untouched it appeared solid and comfortable enough. In both cases the entrance faced the only open part of the scrub by which the nest could be approached, so that the sitting-birds could see, and leave the nest at, the first signal of danger. When disturbed, they alighted on the ground a few yards off, and then quickly disappeared in the scrub with long bounding hops. One I watched soon came back in the same hopping style, stopping every few yards and stretching its neck to the utmost to see if the way was clear. Altogether the nests were extraordinary-looking structures in extraordinary positions. It appears to me that their normal position is on the ground, but that when the birds can find such natural, elevated surfaces to place their nests on, they have sense enough to take advantage of the circumstance, instead of confining themselves to the regular groove."

The eggs are typically very perfect and broad ovals. The shell is thin, fine, and glossy. The ground-colour is white, sometimes a china-white, sometimes with a very faint creamy tinge. The markings, which are specks and spots, and in some few eggs small smudges, are as a rule pretty thickly set about the broad end, and very thinly distributed (at times almost wanting) over the rest of the surface of the egg; but in one specimen the markings are thinly but pretty evenly distributed over the whole egg, and in another it is at the narrower and not the broader end that the majority of the markings are clustered. As in all similar eggs, some specimens exhibit many more markings than others. The markings are in two colours—the one varying in different eggs through dull red, purplish red, maroon, and purplish maroon to almost black (and these are alike most conspicuous and most numerous), and the other varying through pale purple, pale inky purple, and purplish grey, or rarely purplish brown (and these markings chiefly occur where the others are numerous and more or less thickly set).

In length the eggs vary from 1.11 to 1.3, and in breadth from 0.89 to 1.0; but the average of seventeen eggs is 1.19 by 0.97 nearly.

Pitta cyanea, Blyth. *The Blue Pitta*.

Pitta cyanea, Blyth, *Hume, Cat.* no. 344 ter.

Major Bingham writes from Tenasserim:—"For some reason or other, Pittas were excessively plentiful this year at Kaukarit.

"Of the above species I found two nests with eggs, and four with young ones. Of these I only found one myself, the others were marked down for me, and I went and saw them.

"All the nests were of one type, globular masses of earth, leaves, twigs, &c., bound together with vegetable fibre, and lined interiorly with roots. One I measured was about 8 inches in diameter, and about the same in height. In five, the entrance-hole was about halfway up one side. In one the opening was close on to the ground. The two nests with eggs were found respectively on the 23rd and 26th May, and contained, one four, and one five eggs. These nine eggs are all of one type, ground-colour glossy white, spotted, scratched, and streaked, especially at the large end, with purple, and having also obscure purplish cloudy spots. They measure 1.09×0.85 , 1.07×0.85 , 1.08×0.86 , 1.05×0.82 , 1.05×0.85 , 1.09×0.86 , 1.06×0.83 , and 1.05×0.82 ."

Mr. J. Darling, Junior, informs me that he extracted a fully-formed egg from the oviduct of a female of this species at Tavoy.

The eggs of this species are very like those of *P. cucullata*. They are broad ovals, not nearly so spherical as those of *P. brachyura*, with a fair amount of gloss, but again by no means so glossy as those of the species just referred to. The ground-colour varies from white to creamy white, and they are pretty thickly marked with small scratches, streaks, spots, lines, and blotches of a darker and paler shade of purple—the one varying from reddish purple

to almost black, the other from pale lilac to sepia. The markings are very commonly most dense, largest, and most pronounced in colour about the large end, where they not unfrequently form an irregular scratchy, speckly cap. In some eggs all the markings are very small and speckly and are comparatively densely set. In others they are larger, more intense in colour, and much less numerous.

Pitta cyanoptera, Temm. *The Lesser Blue-winged Pitta.*

Pitta moluccensis (Müll.), Hume, *Cat.* no. 345 bis.

The Lesser Blue-winged Pitta occurs and breeds throughout British Burma, from Tonghoo to the Pag-ghan Estuary, and from the coast of Arracan to Karennee, keeping, as a rule, however, in the thin tree-jungle that everywhere skirts the bases of the innumerable larger and smaller hill-ranges that intersect the Province. It is not as a rule, I believe, a permanent resident, but suddenly makes its appearance between the early part of April and the end of May, arriving earlier at Tavoy, for instance, and later at Thayetmyo. It comes and goes in a very strange manner. One day thousands are to be seen, the next not a bird is to be found; but when the monsoon commences they settle down here and there and breed, laying five or six eggs, and by the cold season have all, or mostly all, retreated south. *P. brachyura* similarly moves in multitudes upwards in India, about the setting-in of the S.W. monsoon.

Davison was, I believe, the first to take the eggs of this species. Writing from Amherst, in 1875, he remarks:—

“On the 15th July I found a nest of this Ground-Thrush containing six very much incubated eggs (shooting the bird as she flew from her nest). This nest also, like that of *P. cucullata*, was placed on the ground at the root of a small tree; but it was built in much thinner jungle, only about 3 or 4 yards from a footpath, and was quite exposed to view. It was conspicuously smaller and much less roughly put together, though composed of exactly the same materials (to wit, dry twigs and leaves, and lined with fibres) as the nest of *P. cucullata*; but the roof-sides, as well as foundation, were much thinner, and it wanted the conspicuous platform in front of the entrance-hole of the nest of that species—the entrance in this present nest being almost on a level with the ground. It measured 8 inches in diameter, 5·5 in height, the entrance 3·5 in diameter; the egg-cavity 5·5 wide interiorly and 3·5 high.

“These Ground-Thrushes apparently sit very close, as in both this case and in that of *P. cucullata* I walked to within a couple of feet of the nests before the birds left them.”

Mr. Oates writes from Pegu:—“June 27th. Nest placed on the ground in thick forest on a hill-side in a small patch of thatch-grass, but in no way concealed from view. Oven-shaped, about

10 inches long, 8 broad, and 6 high, with a 3-inch circular hole at one end; side of nest everywhere rather more than 1 inch thick; composed of large dead leaves and roots all matted together with earth. On the exterior there are some large sticks and twigs. Eggs five (female sitting very closely, although the eggs were fresh), highly glossy, white, beautifully marbled with marks of inky purple and lines or scrawls with a few dots of reddish purple. The whole shell is very thickly covered with these marks, more so at the thick end than elsewhere. Size 1.15, 1.12, 1.08, 1.10, 1.10, by .88, .87, .88, .88, .87, respectively.

"On the same day three other nests were found, presumably of this species. From the remains of egg-shells near one, it was evident that the young had flown. The other two appeared to be new; one was placed on the side of a nullah on the root of a tree, and the other on a tree-trunk where the tree separated into three branches about two feet from the ground."

Major C. T. Bingham found some nests of this *Pitta* in Tenasserim. He says:—"I got my first nest of this bird at Pynekyoon, on the Pynekyoonchoung, a feeder of the Hlinebooe river.

"On the 2nd May, a long hot march from the top of the Dawna Pass took me to Pynekyoon, at the outskirts of which I heard *Pitta cyanoptera* calling loudly. Going through some scrub and bamboo, I flushed one of these, and to my delight found she had been seated on two fresh glossy white eggs, streaked and boldly blotched with purplish lilac, which were laid inside a firmly made little round oven of a nest, some 7 or 8 inches in diameter, with the entrance high up on one side. The nest was constructed of bamboo-leaves matted together with earth, and placed at the roots of a bamboo-bush. On the 9th May I found a second nest at the foot of a rhododendron-bush on the side of the hill behind Maulmain. This was a much larger affair and much more loosely made. It looked for all the world like an accumulation of leaves and grass, and but for my dog flushing the female off it, I should never have taken it for a nest. It contained three eggs of the same type as above described, and the cavity in which they lay was lined with roots, &c. A third nest I found unfinished. A fourth on the 25th May, at Kaukarit on the Houndraw, containing 5 eggs.

"In all 10 eggs procured: these measure 1.05 x 0.87, 1.02 x 0.86, 1.02 x 0.86, 1.01 x 0.82, 1.00 x 0.83, 0.99 x 0.87, 1.01 x 0.87, 0.95 x 0.81, 1.00 x 0.86, and 1.00 x 0.82."

The eggs procured by Mr. Davison are in some respects of the regular *Pitta* type, very round ovals, glossy, and with a white or creamy-white ground, but they are, as a rule, far more thickly marked and richly coloured than those of any of our other Ground-Thrushes with which I am acquainted. The markings consist of rather small, generally irregular, often angular, blotches, spots, streaks, smudges, and lines, thickly set, and, to judge from the six eggs before me, pretty uniformly distributed over the whole surface of the egg. They are of two colours—maroon-red, almost

wanting in some eggs, and inky purple-black, or very nearly so in many spots.

The eggs vary from 1 to 1.04 in length, and from 0.85 to 0.9 in breadth*.

Pitta brachyura (Linn.). *The Indian Pitta*.

Pitta bengalensis (Gm.), *Jerd. B. Ind.* i, p. 503.

Pitta coronata (Mull.), *Hume, Rough Draft N. & E.* no. 345.

My friend Mr. F. R. Blewitt has taken a vast number of the eggs of the Indian Pitta in the neighbourhood of Raipur, Central Provinces. The nests, three of which he sent me with the eggs, were huge globular structures, fully 9 inches in horizontal diameter and 6 inches high, with a circular aperture on one side. They were composed internally of fine twigs, notably those of the tamarisk, and grass-roots; externally, of dry leaves, many of them skeleton leaves, held in their places by a few roots or twigs. The internal cavity may have been about 4 inches in diameter. The nests were placed in brushwood and scrub jungle, either on the ground or on low branches close to the ground. The nests were taken in July and August. They also breed, I know (though I could never find the nests), in the Doon and the northern parts of Rohilkund. Mr. R. Thompson remarks:—"As this bird comes in regularly about the first week in May, and remains in the Bhabur till July or August, uttering its sweet call of two simple notes, I am led to think it breeds with us. What becomes of the bird at other seasons I do not know."

Few Indian eggs are more beautiful than those of this species. In shape they are excessively broad and regular ovals; some, indeed, are almost spherical. They are excessively glossy, more so than almost any other egg I know. The ground-colour is china-white, sometimes faintly tinged with pink, sometimes creamy; and the eggs are speckled and spotted with, and in some eggs also painted with fine hair-like lines of deep maroon, dark purple, and sometimes brownish purple, as primary markings, and pale inky purple as secondary ones. The primary markings are scattered, in some instances pretty thickly, in others very sparingly, over the

* *PITTA MEGARHYNCHA*, Schleg. *The Larger Blue-winged Pitta*.

Pitta megarhyncha, Schleg., *Hume, Cat.* no. 345 ter.

Mr. J. Darling found the nest of this Pitta at Tapraw in the island of Tongkah, not far south of Tenasserim. This was on the 17th April. The nest was of the usual type, and contained no eggs. The female to which the nest belonged, however, proved on examination to have a fully-formed egg within her.

This egg is too broken to permit of its being measured or its shape correctly described, but it appears to have been a very broad short oval. The shell is very fine, and though the egg was taken from the oviduct it is fairly glossy, so that, laid in the natural way, it would have probably been highly glossy. The ground is white, with a faint lilac tinge, and it is richly but not very thickly streaked and marbled everywhere with dull maroon and pale inky purple.

whole surface of the egg, but are always much denser towards one end, to which in some eggs they are entirely confined, and here alone the secondary markings are at all conspicuous. Here they often form a sort of nimbus round all the spots, blotches, and lines, all the interstices between which they occupy and unite to form an irregular mottled cap. There is something about the character of the egg which indicates to me that the Pittas should be placed nearer the Bulbuls and the Orioles than the true Thrushes. I should note that there is one not uncommon type in which the whole egg is devoid of markings, except within a broad zone near one end, and even here they only consist of widely scattered and minute specks of maroon and pale lilac.

The eggs vary from 0.96 to 1.07 inch in length, and from 0.81 to 0.9 inch in breadth; but the average of fifty eggs is 1.01 by 0.86 inch nearly.

Pitta cucullata, Hartl. *The Green-breasted Pitta*.

Pitta cucullata, Hartl., *Jerd. B. Ind* i, p. 504.

Melanopitta cucullata (Hartl.), *Hume, Rough Draft N. & E.* no. 346.

According to Mr. Hodgson's notes and drawings the Green-breasted Pitta breeds in the central regions of Nepal and about Darjeeling in April and May. They build a large globular nest, one of which measured nearly 6.75 inches in external diameter, and had a circular opening fully 3 inches in diameter on one side. They place their nests very generally on the ground, in clumps of bamboos, and they construct them of dry bamboo-leaves and twigs and other dry leaves and stems firmly and compactly interwoven. The exterior is rough and strong; the interior lined with soft vegetable fibres. They lay four eggs, very broad ovals, glossy, with a pinky-white ground, pretty thickly spotted all over with reddish and brownish purple; an egg figured measures 0.96 by 0.79 inch.

Dr. Jerdon says:—"I only procured one specimen, which was killed by a Lepcha, when seated on her nest, on the banks of the great Rungit River, about 1200 feet above the sea. The nest was composed chiefly of roots and other fibrous matter, with a few hairs, and contained three eggs of a faint greenish white, with a few reddish and some fawn-coloured spots."

Mr. J. R. Cripps writes from Sylhet:—"On the 25th May, 1875, a nest containing 2 eggs was brought me; the bird too was brought, having been captured while incubating. The nest (which was about 5 inches in diameter, perfectly round, the egg-cavity being 3 inches by 1½ in depth) was composed outside of thick grass-roots and dead leaves, and inside of thin grass-roots and fibres, and was placed about a foot inside of a hole near a bamboo clump in heavy jungle. I kept the parent bird (which was, I think, a female, as the colours were duller than those of one or two I have

seen in the jungle) alive several days by feeding it on ants' eggs, during which time it never uttered a sound; but if it hopped on to its perch there it would sit for ever so long with a vacant stare. It had a black patch separating the crimson and green of the underparts, as noticed by Mr. E. Oates, 'Stray Feathers,' vol. iii. p. 100. Unfortunately one morning the servant, while giving it its food, let it get out, and I never even had a glance of it to shoot it for skinning."

Mr. W. Davison records the following note:—"On the 12th of July, 1875, I found a nest of the Green-breasted Thrush at Amherst in Tenasserim.

"The nest was in rather thick tree-jungle at the base of the hills, placed on the ground at the root of a small tree and partially hid from view by grass. It was composed of dry twigs and leaves, resting on a thick foundation of dead leaves and lined with fibres. It was a globular structure, with a circular opening about midway on one side; the roof of the nest projected over the entrance about 2·5 inches, forming a canopy or portico over it. It was very loosely put together, at least the outer portions of it, and measured 10 inches in diameter by 9·5 in height; the entrance having a diameter of 3·5 inches. At the base of the entrance was a platform composed of twigs and loosely put together, and about 4 inches wide, which sloped gradually to the level of the surrounding ground, the top of the platform being nearly on the same level as the bottom of the egg-cavity. The nest contained four eggs very much incubated."

The eggs are of the true Pitta type; broad ovals with a spherical tendency (not so strongly marked, however, as in *P. brachyura*), glossy, and with a pure white or creamy-white ground, more or less thickly speckled, spotted, and marked with small angular, at times hieroglyphic-like, blotches, streaks, or lines of purple, redder, or again more lilac, in some, or deeper and more chocolate in others. The markings, always apparently most dense at the larger end, are occasionally almost entirely confluent, and often form there an irregular speckly spotty cap. At the small end the markings seem to be always fewer and smaller, and in some eggs are almost wholly wanting.

In length the eggs vary from 1·04 to 1·1, and in breadth from 0·82 to 0·86.

Order EURYLÆMI.

Family EURYLÆMIDÆ.

Calypptomena viridis, Raffl. *The Green Broubill.*

Calypptomena viridis, Raffl., *Hume, Cat. no. 137 bis.*

Mr. J. Darling, Junior, found several nests of this species in Tenasserim. He says:—

“April 3rd. Found a nest of *Calypptomena viridis*, with three eggs. Of these two were well set and one rotten. The nest was suspended from the branch of a small sapling, $4\frac{1}{2}$ feet from the ground, and was in the heart of heavy forest at the foot of Nwalabo mountain, in an easterly direction some 37 miles from Tavoy.

“April 10th. Took three set eggs of *C. viridis* in heavy jungle at the foot of Nwalabo; the nest was suspended from the branch of a small sapling, 5 feet from the ground. This nest was in the same locality as the one taken on the 3rd.

“April 11th. Also another nest of *C. viridis*, just completed but with no eggs. This nest had no tail-like appendage, but had a great deal of moss incorporated with it; 6 feet from ground.”

The nests of this species obtained in the neighbourhood of Nwalabo in Tenasserim are perhaps the most remarkable of any of the nests of the Broubills. They are invariably suspended from small twigs, generally across them and not from the extreme tip, and are egg-shaped, except at the top, where they are, as it were, pinched out flat along the twig, and from them depends a long tail, in some specimens fully 3 feet in length. The body of the nest is only about 9 inches in length and $\frac{1}{4}$ in diameter; the entrance is large and oval, towards the upper part of the nest, from 3 to $3\frac{1}{2}$ inches in height, and 2 to $2\frac{1}{2}$ in width; the cavity is also perfectly egg-shaped, and is from $5\frac{1}{2}$ inches to $6\frac{1}{2}$ in height, and 3 to $3\frac{1}{2}$ in diameter. Exteriorly the nest, which is very closely put together, and much more compressed and compact than that of *Parisomus dalhousii*, is sometimes composed entirely of fine grass, and it is in these nests in which the tail, also entirely composed of this same fine grass, is most developed. In others less of this grass is used, and a good deal of moss is incorporated in the outer structure. In others again quantities of fine hair-like black roots and moss form the chief constituents of the exterior of the nests, though in these, too, a good deal of fine grass and other vegetable fibre is intermixed, and in these nests the tail is less developed, being here only 8 or 10 inches in length. Inside this exterior coating, the

nest is composed of broad flags, bamboo-spathes, and the like, and inside this, at the bottom of the cavity, is a lining of soft grass.

The eggs of this species are very gracefully shaped, elongated ovals, rather pointed towards the small end. The shell is extremely fine, fragile, and delicate, but has little or no gloss. In colour these eggs are a very pale yellow, a creamy or ivory-yellow in most specimens, but in some few with a faint maize shade. All my eggs are perfectly spotless and uniform in tint throughout. Six eggs measure 1.05 to 1.21 in length, by 0.74 to 0.82 in breadth.

Psarisomus dalhousiae (Jameson). *The Long-tailed
Broadbill.*

Psarisomus dalhousiae (Jameson), *Jrd. B. Ind.* i, p. 236; *Hume, Rough Draft N. & E.* no. 138.

On the breeding of the Long-tailed Broadbill, Dr. Jerdon says:—"The nest and eggs were once brought me (at Darjeeling). The former was a large structure of moss and grasses loosely put together, and was said to have been placed in the hole of a tree. The opening of the nest had apparently been at the side, but it was so much damaged by being pulled out of the hole, and was so little coherent that I could not exactly ascertain this point. The eggs were two in number, and white."

Mr. Hodgson gives a different account; from his notes it appears that this species begins to lay in April, the young being ready to fly in June or July. The nest, which he also figures, is described as suspended from a tree, composed of fine roots and creepers, in which leaves are largely intermingled; in the side, about the centre, is a circular aperture which is protected by a sort of hanging portico or curtain of leaves; the lining is said to be of grass, roots, and dry bamboo-leaves. The nest is drawn as of a very regular egg-shape, the smaller end only, from which it is suspended, being drawn out to a point. The greatest length is nearly nine inches, the breadth five, the diameter of the aperture barely two; the drawing of the nest shows that it is very compactly woven, exteriorly with roots and fibres. It is noted that they lay three to four eggs, breed only once a year, and that both the male and female assist in rearing the young. The egg is figured as pure white, a rather broad oval, decidedly pointed towards the small end, measuring 1.1 by 0.75 inch.

Colonel G. F. L. Marshall writes to me that on the 16th of June he killed a female of this species at Nynsee Tal, at an elevation of about 5000 feet above the sea. The oviduct contained an egg, nearly ready for expulsion, white, and with no indications of coloration or markings.

From Sikkim Mr. Gammie writes:—"I took a nest of this Broadbill, out of which the female rose, on the 20th April, at about 2500 feet elevation. It was suspended from the frond of a slender tree-fern, which had to be cut down before the nest could be

reached. Unfortunately I had taken it too soon, for it was quite empty. Both its position and structure agreed with Hodgson's description.

"I have only once taken the eggs of this Broadbill, but have frequently seen and taken empty nests, which form rather conspicuous objects, hanging, as they do, from the tops of tall slender trees. So slender are the nesting-trees that I have never seen a nest that could be taken without first cutting down the tree. The nest is well described by Hodgson, but those I measured were some two inches longer and wider than the dimensions given by him, and they were lined with a few green leathery leaves after the manner of *Serilophus rubropygius*. One nest I took on the 17th May at 2500 feet elevation contained five fresh eggs. I shot the female off the nest. Her stomach was filled with beetles and other insects, and did not contain a trace of fruit or seeds."

Mr. J. Darling, Junior, says:—"April 3rd. Noticed a nest of *Parisomus dalhousie*, halfway up Nwalabo in Tenasserim. A very large round structure suspended about 30 feet from the ground. Could not be got at."

Major C. T. Bingham writes:—"I procured several specimens of this lovely Broadbill at Tounjah, halfway between Kaukaryit and Meeawuddy, in April 1878. They were breeding then, and I discovered no less than six nests in one tree, but all un-get-at-able, the tree being covered with sharp, strong, curved thorns on hexagonal bases."

The nests, of which several beautiful specimens have been sent me from Sikhim by Mr. Gammie, are enormous structures compared with the size of the bird. They are egg-shaped or pear-shaped, suspended from the end of a twig, and measure from a foot to nearly 18 inches in length, and from 8 to 10 inches in diameter. Exteriously they appear to be composed of fine roots, the tendrils of creepers and other fibrous and stringy vegetable matter, and interiorly of grass, lined generally with broadish flags or spathes of the bamboo. The entrance is about one third of the way up, circular, perhaps from an inch and a half to two inches in diameter. The cavity is nearly spherical, and from four to five inches in diameter. In some cases a regular portico is produced over the entrance, so that the nest is like an enormous Sun-bird's nest, though devoid, in all the specimens that I have seen, of the pendent streamers and exterior ornamentation which characterize the nests of these latter.

The eggs are always considerably elongated ovals, a good deal, in some cases conspicuously, pointed towards one end. They vary a good deal in size. The shell is extremely thin and fragile.

The eggs appear to be of two types, just as are undoubtedly those of *Dicrurus ater*. In the one type the eggs are pure white, and have then a fair amount of gloss. In the other the ground has often, though not always, a pinky tinge; there is generally scarcely any gloss, and the egg is blotched, chiefly about the large end, with red and very pale reddish purple. Both types seem to

be identical in shape and texture, and there are large and small ones of both, but the eggs with markings are almost glossless, while those which are pure white are fairly glossy.

Nine eggs measure from 0.93 to 1.13 in length, by 0.65 to 0.76 in breadth.

***Serilophus lunatus* (Gould). *Gould's Broadbill*.**

Serilophus lunatus (Gould), *Hume, Cat. no. 130 bis*.

Mr. W. Davison writes of this Broadbill in Tenasserim:—"This species breeds, I should say, from April to July. On the 4th of April, at the village of Om-ben-gwin, on the road from Tavoy to Moulmein, I found a nest of this species, shooting the female as she left it.

"The nest was empty and not completely finished; it was built at the end of a small branch overhanging a stream, and in appearance was like that of a huge nest of *Archmephtha asiatica*.

"At Amherst on the 11th July my Burman shikaree brought me four partially incubated eggs, together with the female bird shot off the nest. Unfortunately he had destroyed the nest (thinking it of no value), but he described it as a moderately large globular mass of dry grass, small twigs, and dead leaves, with the entrance on one side, suspended from the extreme tip of a branch of a bush about 4 feet from the ground. The nest was found in thin tree-jungle at the base of the hills. The dimensions he gave would make the nest about 6 inches in diameter and 7 to 8 high.

"On the 28th of July I found an old nest clearly belonging to this species. The young had flown, but in the nest was one added egg, pure white, and similar in shape to those brought to me, but somewhat smaller; no doubt one of those abnormally small and unfecundated eggs continually laid by birds of all species.

"The nest was suspended to the extreme end of a small branch overhanging a stream, the bottom of the nest being about 8 feet above the surface of the water. It was about 2 feet in total length; at about 15 inches from the point of suspension, the suspending portion of the true nest branched into two, meeting the nest at opposite sides, like a very broad handle to a basket, and leaving, as it were, two wide openings to the nest. Probably the nest had originally only one entrance, but as the young grew it was found that there was not room for them all to perch (as young birds delight in doing) on the edge of the original entrance, so another opening was effected on the opposite side, thus giving the nest its basket-like appearance."

Mr. Oates writes from Pegu:—"I found a nest of this species a few miles from Pegu at the commencement of May. It was empty. On the 12th I revisited it, and took four eggs, which were all fresh, although the old bird was sitting.

"The nest was suspended from the branch of a small shrub in

dense evergreen jungle. The nest itself is a ball about six inches in diameter exteriorly, with a circular opening two inches wide exactly in the centre. The entrance is protected by a rude porch. The materials are chiefly coarse grass, and the outer bark of elephant-grass and weeds bound together by fine, black, hair-like roots. The exterior of the nest is adorned with numerous yellow cocoons. Towards the bottom of the nest the materials become very coarse and are loosely put together, the ends straggling down a foot or more, forming a long tail. The total length is nearly two feet. The interior of the nest is beautifully and firmly lined with broad leaves of elephant- or thatch-grass, and a few green leaves are spread over the egg-cup. Altogether the nest is one of the most elaborate I have seen, differing in nothing but size from some of the many nests of *Arachnechthra flammavillaris* that I have found."

Major C. T. Bingham records the following note from Tenasserim:—"On the 23rd April Myat-jo brought me a nest and two eggs of the above species. Having twice taken this nest before, I had no doubt these were authentic. The nest was made of moss, vegetable fibres, and coarse grass, and had been suspended from the end of a slender bamboo-shoot hanging over the Meplay stream. Exteriorly it measured 10 inches in length by 6 inches in diameter. A hole at the side led to the interior cavity, which was beautifully lined with bamboo-leaves.

"I found a second nest three days after, at the mouth of the Kunnoot choung, a feeder of the Thoungyeen. This was made of similar materials, but was very loose and 'straggly' in construction. It was suspended from a cane not more than four feet from the ground, and contained five eggs slightly set."

Mr. J. Darling, Junior, also writes from Tenasserim:—"March 30th, found a nest of *Serilophus lunatus* nearly completed, but with no eggs; a great ball of twigs, moss, and cocoons. Suspended from end of a branch, with entrance-hole on one side, and a lining of green leaves."

The nest, about 10 inches long and 4 in diameter at its widest part, is nearly egg-shaped. It is composed of vegetable fibre, like fine tow and black roots, very fine and hair-like, and in amongst this are incorporated interiorly numerous dead leaves and thin twigs, externally scraps of green moss, bits of wool, and a few cocoons. The entrance is at one side near the middle, large and oval. The interior is at present chiefly thin sticks and dead leaves, but doubtless a lining would have been added.

The eggs vary a good deal in shape, but are typically rather elongated, somewhat pyriform ovals, very blunt at both ends.

The shell is excessively fine and delicate, fragile to a degree, looking to the size of the egg, pure white, and with a slight gloss. About the large end it is pretty thickly marked with specks and minute spots of what I should call purplish black, but which are minute and so dark that it is difficult to be certain of the colour. The small end appears to be entirely free from markings, but

minute specks of this same dark colour are scattered over the rest of the egg.

The eggs vary from 0.85 to 1.0 in length, and from 0.62 to 0.69 in breadth; but the average of twenty eggs is 0.95 by 0.67.

***Serilophus rubropygius* (Hodgs.).** *Hodgson's Broadbill.*

Serilophus rubropygia (Hodgs.). *Jerd. B. Ind.* i. p. 238.

From Sikkim Mr. Gammie writes.—“On the 15th May I took the only nest I ever saw of this rather rare bird. It was attached to a slender twig which hung from an outer branch of a solitary dwarf tree growing in a moist hollow, within a few hundred yards of my own house, at an elevation of about 3000 feet above the sea. So close to the ground was it hanging that the small boy who was with me managed, after stepping gently up to the tree, to put his hand across the entrance and capture the bird, which proved, on dissection, to be the male, but entirely destitute of the silver-coloured neck-spots with which this species is generally adorned. Its stomach was well filled with the remains of grasshoppers and other insects, without a trace of either seeds or fruit.

“A quantity of towy-looking fibre was twined round the twig from the top of the nest to its junction with the horizontal branch, about a foot above, and a little of the same kind of fibre dangled from the bottom of the nest. The twig was worked in with the building material to keep the nest steady. The structure was oval-shaped, somewhat flattened on the entrance side; made of dry bamboo-leaves and grasses, intermixed with a considerable proportion of fibrous material, which gave strength to the nest. The cavity measured 4.25 inches in height, 3 in width, and 2 deep from lower edge of entrance. It was very neatly lined with quite green, small, leathery leaves. Externally the body of the nest measured 9 inches long by 5 wide, with an entrance 2 in diameter, over which the building material bulged out about 2 inches, so as to form a sort of portico.

“The eggs were five in number, and as they were slightly set, five is probably the full complement.”

The nest above referred to, kindly forwarded to me by Mr. Gammie, is similar in general character to those of the other Broadbills. It was, as usual, suspended from a leafy twig, more cylindrical and less oval, about 8 inches in length and 5 to 5½ in diameter. The entrance near the top is circular and about 2½ inches in diameter. The egg-cavity is about 4 inches in height and 3 in diameter. Exteriorly the nest is composed of fine grass and vegetable fibre, very closely matted and felted together, and interiorly it is lined with, and composed of, bamboo spathes and leaves. The bottom of the nest is fully 2½ inches in thickness, and the sides are nearly an inch in thickness, in some cases perhaps even more.

The three eggs found by Mr. Gammie are rather elongated ovals, a good deal compressed towards the smaller end. The shell is very

fine and delicate dead white, with a faint gloss, and it is thinly speckled and minutely spotted with very deep purple, which, in some spots, appears almost black. The markings are most numerous about the larger end, and almost wanting at the smaller end.

The eggs vary in length from 0·92 to 0·97, and in breadth are all 0·66.

***Eurylæmus javanicus*, Horsf. *Horsfield's Broadbill*.**

Eurylæmus javanicus, *Horsf.*, *Hume*, Cat. no. 139 ter.

Mr. W. Davison writes from Tenasserim :—"This present species breeds in March. On the 21st of that month I took a nest on the banks of the Bankasoon choung. It was suspended to the extreme tip of a very tall bamboo overhanging the stream. It was a massive structure, composed of moss, fibres, roots, dry leaves, bits of wool, and small twigs. It measured, in total length, 23 inches by 9 at the broadest part. The lower edge of the entrance-hole, which measured 2·75 inches in diameter, was 5 inches from the bottom of the nest, and placed at one side. The egg-cavity was about 3 inches deep by about 3 wide, and thickly lined with dry bamboo-leaves. The nest contained two fresh eggs."

The eggs are moderately elongated ovals, somewhat compressed towards the small end, but not pointed there, on the contrary rather obtuse. The shell is very fine and fragile, but it has no perceptible gloss. The ground-colour is a dull white, and is thickly speckled with minute spots and specks of rusty brown. These specklings are most numerous towards the large end, where in one egg they form an irregular, mottled, almost confluent zone; in the other they only form a large irregular patch at one side of the broad end of the egg. I do not know any other Indian egg for which this could be mistaken.

The eggs measure 1·09 by 0·76, and 1·03 by 0·74.

***Cymborhynchus macrorhynchus* (Gm.). *The Black-and-Red Broadbill*.**

Cymborhynchus macrorhynchus (Gm.), *Hume*, *Rough Draft N. & E.* no. 139 quint.

The Rev. Mr. Barb, who obtained this species, the Common Rouge-et-noir Broadbill, in Tenasserim, states, as quoted by Mr. Blyth, that "this species is common in watery situations, and suspends its nearly globular nest, which is constructed of small twigs, from the branches of trees growing directly out of the water; the eggs are four in number, and pale spotless blue."

Mr. W. Davison writes :—"I have never been fortunate enough to obtain the eggs of this species in Tenasserim, though I have found several nests, but all with young. The nest resembles that of *E. javanicus*, and like it is attached to the extreme end of a branch or bamboo overhanging water. I have found the nests from April to June; three young in each."

He subsequently found the eggs at Kussoom, and he furnished me with the following interesting note:—

“At Kussoom, in the northern part of the Malay peninsula, I, in company with Mr. Darling, took two nests of *Cymborhynchus macrorhynchus*.

“The first nest was from a bush growing by itself in an open bit of uncultivated paddy-land. The nest was of the ordinary type, a huge globular mass composed of grasses, roots, twigs, and fibres, very coarse and loosely put together on the outside, finer and more compact in the interior. This nest was placed lower than any I have ever seen, the bottom of the nest being only some $3\frac{1}{2}$ feet from the ground. It was suspended to the extreme point of one of the outermost branches of the bush. This nest was evidently an old one that the birds had taken into use again, for many weeks before it was reoccupied it was discovered by Mr. Darling, who occasionally, whenever he passed that way, looked into it, but always found it empty; but soon after my arrival at Kussoom, happening to pass that way, the nest was pointed out to me. I walked up to the bush to examine it, and to see if it really was a Broadbill's nest, for the situation struck me as being odd, my experience of both *E. javanicus* and *C. macrorhynchus* (for though I have not been fortunate in securing eggs, I have found very many nests with young, and many more old ones) being that the nest is usually built at the extreme end of some branch or bamboo, a good height above ground, and generally overhanging some stream or pool of water, so as to be well out of the reach of monkeys, wild cats, &c. On reaching the nest and looking in I found it contained one egg, the bottom of the nest having been lined with fresh green leaves. The next day I again visited the nest and found a second egg laid, on the next a third, and on the next a fourth. I did not take the eggs then, but waited several days, visiting the nest once, and sometimes twice, each day. I continually saw the bird, and as it had to fly for nearly a hundred yards, after leaving the nest, over the bare paddy-land before reaching cover, I had a good look at it each time. The eggs in this nest were white, rather thickly covered with black spots. The green leaves in the nest were renewed every second or third day.

“The second nest was suspended to the extreme tip of a huge bamboo overhanging some excessively boggy ground, and was, I should say, about thirty feet from the ground. When the nest was first discovered there was no way of ascertaining whether it contained eggs or not, but by cutting down the bamboo. This Mr. Darling carefully did, cutting partially through the inner side of the bamboo, and then gradually bending it down till I could reach it. On putting my fingers into the nest I found it contained one egg only, which I removed, but was much astonished to see that it was of a totally different type from those in the other nest, of whose identity I was positive. I thought I had made some mistake (and yet I saw a *Cymborhynchus* leave the nest), so I replaced the egg in the nest, and with the aid of a prop and a few strong creepers managed to raise the nest some seven feet off the

ground, where we left it. Next day I visited the nest again and found a second egg of the same type laid, and both birds close by; day after day for nearly a week did I continue to visit the nest, but no more eggs were laid, though both birds continued to pass in and out of the nest, but they didn't seem inclined to sit. On the morning of the day I left Kussoom I visited the nest for the last time in company with Darling. We hid ourselves close to the nest and saw both birds pass in and out of the nest, Darling at last shooting one, which proved to be the female, as she left the nest. The two eggs from this nest had no black spots at all, but were so thickly covered with spots and blotches of rusty red as almost to appear entirely of this colour. In this case, as in the other, the eggs were laid on a layer of green leaves. This second nest was not so large by a third, I should say, as the first, but seemed to me more compactly put together."

Mr. J. Darling, Junior, says:—"April 20th. Nest of *Cymborhynchus macrorhynchus*, with three fresh eggs, on side of small stream, suspended from end of a branch of a tree, some 20 miles east of Tavoy."

The nest of this species taken by Mr. Darling was suspended across a horizontal twig, the point of suspension being fully 4 inches broad. Below this the nest is oval in shape, about 9 inches in length and 4 to 4½ in diameter. The aperture, which is rather more than halfway up, is circular, and 2½ inches in diameter. The upper part of the nest is almost entirely composed of green moss firmly felted together, only very slightly intermingled with vegetable fibre. The lower part of the nest is almost wholly composed of dry flags and bamboo-spathes, thinly netted over exteriorly with moss and vegetable fibre, just sufficient to keep the dry flags together. The cavity, which is 6 inches in height and 3 inches in diameter, is lined, especially towards the bottom, with fine stiff grass, which equally serves to keep these flags in their places.

The eggs are regular ovals, but vary a good deal in size and shape, some being broader, others markedly elongated. The shell is extremely fine in texture, and, for the size of the egg, thin; but it is almost entirely devoid of gloss. As in most of these Broadbill's eggs, they vary much in type of coloration. In one type the ground is pure white, and they are densely spotted, and occasionally by the fusion of several spots blotched, about the large end, and thinly elsewhere, with black and dusky grey. In another type the ground-colour is pale pinky buff, or pale salmon-buff, and it is everywhere pretty thickly speckled, spotted, or in some eggs even freckled, with brownish red, which in some eggs of this type is more or less intermingled with specks and spots, or here and there tiny clouds, of a pale inky purple. In this type, too, the markings, though everywhere pretty thickly set, are by far most dense about the large end.

Six eggs measure from 0.99 to 1.13 in length, by 0.73 to 0.76 in breadth.

Order SCANSORES.

Family PICIDÆ

Subfamily PICINÆ.

Gecinus squamatus (Vig.). *The Scaly-bellied Green Woodpecker.*

Gecinus squamatus (Vig.), *Jard. B. Ind.* i, p. 286; *Hume, Rough Draft N. & E.* no. 170.

The Scaly-bellied Green Woodpecker breeds throughout the outer ranges of the Himalayas from the valley of Nepal as far as Murree, at elevations of from 4000 to over 7000 feet. It lays from March to May, both months inclusive, but by far the majority lay, I think, in April. Anyhow I have seen the young out of the nest and able to fly fairly by the end of May.

According to my experience, the rhododendron and the andromeda are the favourite trees of this species, but I have found their nests in various conifers, in oaks, and even (just below the Buboo Pass, above Sooltanpoor, Kooloo) in a horse-chestnut. Usually they excavate holes for themselves some $2\frac{1}{2}$ inches in diameter at the entrance, beyond which it turns down and runs downwards from 1 to nearly 3 feet before it widens into the chamber, which is not less than 5 inches in diameter, and which, from the birds often cutting into a natural cavity, is sometimes two or three times as large; occasionally the bird makes little or no cutting, but only accepts a long natural cavity in some partially decayed branch.

I cannot say that I have oftener found the nest at 40 feet than at 20 feet from the ground, and I have seen one that I could reach up to.

Five is, I consider, the normal number of eggs, but six is not uncommon.

This species is very plentiful about Simla, and writing from here the late Captain Beavan remarked:—"On the 10th May I found the nest of this species with young ones; it was a round hole in the trunk of the common Simla cedar (*Cedrus deodara*), apparently dug out by the bird itself and too small to admit even the small hand of a native boy, so that I was unable to get a sight of the young."

* Mr. E. Hargitt has kindly furnished me with the names used by him in his forthcoming Catalogue of the Woodpeckers in the British Museum, and I have adopted his nomenclature for this work.—Ed.

The late Captain Cock gave me the following note from Dhurumsalla:—"Nests in a hollow oak, rhododendron, or other tree. A very wary bird; will fly off its nest while a person is some way off, and yet its nest is placed very deep down, seldom less than 3 feet. These birds have a knack of finding out a tree whose heart is decayed, and they work through the sound wood till they get to the heart, and then they go downward. Eggs, always six, placed on rotten chips; a fine porcelain-white in colour, and very polished. These birds remain with us all the year round, and are always fat and in good condition. I opened the stomach of a female shot during the winter and late in the afternoon; it was crammed full of minute larvæ of some beetle."

Mr. R. Thompson, referring to Kumaon, tells me:—"They are very common here. They lay in April, chiefly in the hollows of large trees, very often digging a hole for themselves in some large half-decayed branch. Rhododendrons are usually selected by this species for nidification."

Again, from Murree Colonel C. H. T. Marshall writes:—"Several nests in the month of June, all with young. We got the eggs last year in May. The holes are always about 40 or 50 feet up the trees; at all elevations, from 5000 to 7000 feet."

The eggs are ovals, often much elongated, and commonly a good deal compressed towards the smaller end. Shorter and somewhat pyriform varieties are not uncommon. The shell is very fine and delicate, and has a most brilliant gloss. When unblown and fresh, they are suffused with a delicate salmon-pink shade, being more or less translucent, but when blown are of an exquisite china-white.

In length they vary from 1.14 to 1.35 inch, and in breadth from 0.9 to 1.0 inch; but the average of a considerable series is 1.28 by 0.93 inch.

Gecinus striolatus* (Blyth). *The Lesser Indian Green Woodpecker.

Gecinus striolatus (Blyth), *Jerd. B. Ind.* i, p. 287; *Hume, Rough Draft N. & E.* no. 171.

The Lesser Indian Green Woodpecker I only know of as breeding in the Doon, the Kumaon Bhabur, and low valleys running up from it into the hills, and at comparatively low elevations in the Nilghiris, but it doubtless breeds in suitable localities everywhere in the Sub-Himalayan tracts, Assam, Eastern Bengal, and Burma.

They lay from the end of March well into May, in holes of trees, stem or branch indifferently; five is the normal number of the eggs I believe, but I saw four young ones only (and no addled egg) in a nest in the Sewaliks.

From the Pulney Hills Captain Horace Terry remarks:—"I met with this bird two or three times at Pulungi and very fre-

quently at Pittur. I cut out a hole at the latter place the beginning of May, but there were no eggs."

Three specimens of eggs of this species, which I owe to Miss Cockburn of Kotagherry, are, as might be expected, broad ovals, somewhat compressed towards one end, a pure china-white in colour and very glossy. One is as nearly as possible like a large egg of the Great Spotted Woodpecker (*P. major*) of Europe.

Other specimens differ in shape, being slightly elongated and pyriform ovals.

In length they vary from 1.02 to 1.1 inch, and in breadth from 0.74 to 0.85 inch.

Gecinus occipitalis (Vig.). *The Black-naped Green Woodpecker.*

Gecinus occipitalis (Vig.), *Jerd. B. Ind.* i, p. 247; *Hume, Rough Draft N. & E.* no. 172.

The Black-naped Green Woodpecker breeds throughout the lower ranges of the Himalayas from Bhotan to Afghanistan at elevations of from 5000 to nearly 8000 feet, laying from the middle of April to the middle of June four, five, and even six eggs. As regards size and shape of hole, and choice of trees, all that has already been said of *G. squamatus* applies equally well to this species; but I agree with Colonel C. Marshall that their nest-holes are commonly placed much lower than those of the latter species, although I found one nest, in a huge fir-tree on Nagteeba (behind Landour), fully 30 feet from the ground.

Colonel C. Marshall says (he writes from Murree):—"This species breeds very low down in trees, the hole in which the nest was that we found on the 28th of May being only 3 feet from the ground: it contained five fresh glossy-white eggs, long and pointed at the thinner end. They are 1.25 inch in length and 0.85 in breadth. Elevation 7000 feet."

I have always known the eggs of this bird to be laid on the bare wood in the inside of a pretty deep hollow of some more or less decayed tree: but on the 17th June, in the neighbourhood of Darjeeling, Mr. J. Gammie took five hard-set eggs of this species out of a large regularly-formed nest placed at the bottom of a hollow in a tree; the nest being for all the world like that of some *Garrulax*, composed chiefly of coarse moss, roots, intermingled with a little moss and portions of a few broad dry flag-leaves. This was below Rungbee near Darjeeling, at a height of about 5000 feet. It was simply impossible, in my opinion, that the Woodpecker should have had anything to do with the making of the nest, but it is very remarkable, I think, that it should even have accepted some other bird's nest as the receptacle for its eggs. The parent bird was captured on the eggs, so that there can be no mistake about the fact.

Mr. Oates writes from Pegu:—"This bird lays four eggs as a rule, but in one instance I found only three in one nest.

"It is extremely common in all large forests, and breeds from the 1st May to the end of June throughout Pegu."

Major C. T. Bingham, writing from Tenasserim, says:—"On the 28th April I found a nest of this Woodpecker, which was by far the commonest of its tribe in the Reserve. It was merely a hollow some ten feet up in the trunk of a dried Thitpouk tree (*Tetrameles nudiflora*), and the eggs, five in number, rested on a few chips. The entrance-hole was neatly cut, and was about 2½ inches in diameter."

The eggs are very similar to, but usually smaller than, those of *Gecinus squamatus*;* on the other hand, they are very decidedly larger than those of *G. striolatus*. They are of course pure white, and while some are only moderately glossy, others are like polished alabaster. In shape they are normally broad ovals, as a rule conspicuously compressed and pointed towards one end, but pyriform and greatly elongated varieties are not uncommon.

In length they vary from 0.98 to 1.35 inch, and in breadth from 0.83 to 0.92 inch, but they average 1.14 by 0.88 inch.

***Gecinus chlorolophus* (Vieill.).** *The Lesser Yellow-naped Woodpecker.*

Chrysophlegma chlorolophus (Vieill.), *Jerd. B. Ind.* i, p. 280; *Hume, Cat.* no. 174.

Mr. Mandelli obtained a nest of this species on the 20th April. It was a hole in a dry tree at about 14 feet from the level of the ground, and contained three fresh eggs. This was at Nauntchu in Native Sikkim. One egg measured 1.14 by 0.72.

The eggs are of the usual Woodpecker type, in shape somewhat elongated ovals, sometimes a little broader, and then slightly pyriform, sometimes more elongated and slightly pointed towards the small end. Those I have obtained have all been snow-white and very glossy.

Three eggs subsequently sent to me from Darjeeling measured 1.0, 1.0, and 0.99 in length, by 0.73, 0.72, and 0.74 respectively in breadth.

***Gecinus nigrigenis* (Hume).** *The Red-rumped Green Woodpecker.*

Gecinus nigrigenis, *Hume*; *Hume, Cat.* no. 171 ter.

The Red-rumped Green Woodpecker breeds in Tenasserim.

Major C. T. Bingham remarks:—"The handsomest Woodpecker in the jungles I think. All through the Thoungyeen valley it is fairly common, but local.

"In the great laterite belt covered with Eng (*Dipterocarpus*) forest, that runs parallel to the Thoungyeen river, north of Meeswuddy, I found it plentiful; its peculiar cry, and the rich contrast of the jet-black cheeks with the yellow of the chin and throat, once heard and seen, are not easily forgotten.

"On the 18th March, I found a nest of this Woodpecker in a hole in a pyinkado tree (*Xylia dolabriformis*), on the bank of the Mepay choung. Cutting it out with chisel and hammer, I found the passage (about 10 inches in length by $1\frac{1}{2}$ inches in diameter) go obliquely down, and end in a slightly enlarged chamber, in which I found two white, rather long and glossy eggs lying on chips of wood. They measure 1.18 by 0.85 and 1.19 by 0.83. I may add that I shot both male and female before cutting out the nest."

Two eggs of this species taken by Major Bingham are very regular rather elongated ovals, one very obtuse at both ends, much of the Goatsucker type, the other distinctly pointed towards the small end. The shell is fine and glossy, and white, though here and there a good deal soiled with pale yellowish-brown stains.

Hypopicus hyperythrus (Vig.). *The Rufous-bellied Pied Woodpecker.*

Hypopicus hyperythrus (Vig.), *Jerd. B. Ind. i*, p. 270; *Hume, Rough Draft N. & E. no. 161.*

Colonel C. H. T. Marshall found nests of this species, the Rufous-bellied Pied Woodpecker, at Murree towards the latter end of April. They were, as usual, mere holes in trees with the eggs deposited on the bare wood. The only egg I possess of this species and which was one of those taken by Colonel Marshall, is a wonderfully regular oval, pure white, the shell very fine and glossy, and measuring 0.89 by 0.67.

Two other eggs taken by Colonel Marshall at Murree on the 21st April measure, he tells me, 0.85 by 0.65 and 0.87 by 0.67 inch.

Dendrocopus himalayensis (J. & S.). *The Himalayan Pied Woodpecker.*

Picus himalayanus, *J. & S., Jerd. B. Ind. i*, p. 200.

Picus himalayensis, *J. & S., Hume, Rough Draft N. & E. no. 154.*

The Himalayan Pied Woodpecker breeds freely all over the lower ranges of the Himalayas west of Sikhim, at elevations of from 3000 to 8000 feet. They lay in holes in trees, oaks being decidedly their favourite, and, as a rule, in holes excavated by themselves, and with a narrow, circular, neatly-cut aperture. I once, however, saw a pair with young in a natural cavity, to which the birds appeared to have done nothing. The hole varies greatly in depth and diameter, but the egg-chamber, when excavated by the birds, is about 4 inches in diameter, generally quite devoid of lining, the eggs being laid on chips of wood—but at times with a few dead leaves, some moss, or moss-roots, which, whether blown in by the wind or intentionally deposited by the birds, constitute a kind of lining.

I have only found the eggs between the middle of April and the end of June, but I have seen young birds out of the nest about the end of June. Four or five is the usual number of the eggs, and these, when fresh and unblown, appear to be of a delicate, pinky, pearly hue, as are all such delicate glossy-white eggs, owing to the partial showing through of the yolks.

Colonel C. H. T. Marshall, writing from Murree, remarks:—"This breeds early and very high up in the trees. All the nests we found at the end of May had nearly full-fledged young in them, Elevation about 7000 to 7500 feet."

I have, however, found fresh eggs as late as the middle of June, and nests not more than 10 feet from the ground.

Colonel G. F. L. Marshall writes:—"Apparently, in Kumaon, this bird is an early breeder. I found a nest nearly completed on the 23rd April; and on the 9th May from another nest I got two full-fledged young. Both nests were at about 7000 feet elevation above the sea, and near the top of large hill oak-trees some 40 or 50 feet high."

Major Wardlaw Ramsay says, writing of Afghanistan:—"This is the only Woodpecker that I found in the Hariab district, where it was very abundant and breeding."

Almost all my eggs of this species, and I had many, have been lost, stolen, or destroyed, I do not know which.

The only eggs I now possess of this species were obtained on the 28th June in the neighbourhood of Kotegurh. They are the usual Woodpecker type, somewhat larger than those of *D. mahratensis*, *D. brunneifrons*, and *D. macii*, but smaller than those of *Brachypternus aurantius*; pure white (when blown), very glossy, and slightly pyriform.

They vary in length from 0.97 to 1.03 inch, and in breadth from 0.72 to 0.78 inch.

***Dendrocopus cathpharius* (Hodgs.).** *The Lesser Pied Woodpecker.*

Picus cathpharius, *Hodgs., Jerd. B. Ind. i, p. 271; Hume, Rough Draft N. & E. no. 150.*

The Lesser Pied Woodpecker, according to Mr. Hodgson's notes, begins to lay in April, and most of the young are ready to fly in July. It makes a nest like other Woodpeckers, excavating a hole in the trunk of a tree and laying therein four eggs on the chips and dust the result of the excavation. The eggs are pure white; and one is figured as 0.92 inch in length by 0.67 in breadth.

From Sikhim Mr. Gammie writes:—"On the 18th April I took two fresh eggs of this Woodpecker out of a hole in dead tree some 20 feet from ground, at the elevation of about 4000 feet. As usual, there was no nesting material."

The eggs are moderately broad ovals, somewhat compressed

towards the small end, with the delicate shell characteristic of the Picidae, pure white and fairly glossy. They are much smaller than those figured by Mr. Hodgson, measuring only 0·77 by 0·61.

Dendrocopus sindianus (Gould). *The Sind Pied Woodpecker.*

Picus scindianus, Gould, *Jerd. B. Ind.* i, p. 273; *Hume, Cat.* no. 158.

Colonel E. A. Butler remarks of this Woodpecker :—"Lays undoubtedly, I should say, in February and March, although I have not yet taken the eggs. In January this year I observed a pair boring a nest-hole in a large babool tree about 12 feet from the ground. I left it for about a fortnight, and as the bird used to appear at the hole then, whenever I passed the tree, I cut into it on the 1st March, but there were no eggs, although the old bird was on the nest. On the 28th April Mr. Doig found a nest in the E. Narra with young ones, and several birds that I shot and dissected towards the end of May appeared to have finished breeding."

Lieut. H. E. Barnes notes from Chaman in Afghanistan :—"The Sind Woodpecker is very common and breeds during April and May. I have not succeeded in obtaining eggs, but I found a nest containing three young birds on the 6th May—one of which I kept and have succeeded in rearing."

Mr. Scrope Doig writes :—"Found a nest with two fresh eggs on the 2nd April; the eggs were laid in a hole in a tamarisk-tree situated about 4 feet from the ground: the tree was close on the bank of the Narra, the hole facing the north; there was no lining to the nest, the depth of the hole being about 10 inches.

"Found a nest on 24th June, containing young birds; nest was in a hole in a tamarisk-tree, about 5 feet from the ground."

Dendrocopus macii (Vieill.). *The Fulvous-breasted Pied Woodpecker.*

Picus macei, Vieill., *Jerd. B. Ind.* i, p. 272; *Hume, Rough Draft N. & E.* no. 157.

The Fulvous-breasted Pied Woodpecker breeds, I believe, during March, April, and May, according to locality, throughout Eastern Bengal, Assam, and the lower ranges of the Himalayas from the Brahmapootra to the Cabool River. I have never found a nest myself.

Captain Hutton, writing from near Mussoorie, says :—"On the 20th of April I found a nest of this bird at 5500 feet in a hole in a large *Andromeda ovalifolia*; the hole was bored in a rotten branch by the bird, and the nest was nothing more than the chips and fragments of the rotten wood collected at the bottom. It was about 14 inches in depth. The eggs were three in number and

pure white; these I took away, and to my surprise a few days afterwards I found that the bird had laid two more eggs, thus making five in all."

Colonel C. H. T. Marshall, writing from Murree, remarks:—"One nest taken on June 2nd, in a hole in an oak-tree; three eggs, somewhat hard-set. Length 0·9 by 0·65 inch. Elevation 6500 feet."

The eggs of this species, which I owe to Captain Hutton, are of the usual Woodpecker type, very similar in shape and size to those of *D. brunneifrons*, but a trifle smaller. On the other hand, the average perhaps slightly larger than those of *D. mahrattensis*. Typically they seem to be moderately elongated ovals, and the shell is, of course, pure white and very thin and glossy.

Some eggs I have from Mussoorie only vary from 0·88 to 0·92 inch in length, and from 0·66 to 0·7 inch in breadth; but I have only three specimens, so these measurements go for very little.

Mr. Mandelli obtained a nest of this species near Ging in Native Sikhim on the 20th May. It contained three fresh eggs; one of these measured 0·9 by 0·65.

***Dendrocopus brunneifrons* (Vig.).** *The Brown-fronted Pied Woodpecker.*

Picus brunneifrons, Vig., *Jerd. B. Ind.* i, p. 273; *Hume, Rough Draft N. & E.* no. 159.

The Brown-fronted Pied Woodpecker breeds throughout the Himalayas west of Nepal, but rarely, if ever, at any elevation exceeding 6000 feet, and I have seen nests as low as 2000 feet. They lay in April and the first half of May, in holes in trees (oak and fir chiefly), sometimes in the stems, sometimes in large branches, usually neatly-cut ones excavated by the birds themselves, occasionally natural ones, at heights varying from 6 to 40 feet from the ground.

There is no lining to the nest; only a little of the débris of the excavation is left at the bottom for the eggs to rest on. These are usually four in number, but I have seen five.

Captain Unwin, of the 5th Goorkhas, says:—"I found a nest in the Agrore Valley, 6th May, 1870. It was a mere hole in a dry fir-tree, about 9 feet from the ground; it contained no lining, the four white hard-set eggs were laid on small fragments of wood."

Mr. R. Thompson remarks:—"This is a common bird in the Bhabur of Kumaon. I have met with both adult and immature birds. It breeds in the Bhabur."

Captain Hutton, writing from Mussoorie, says:—"A Paroquet (*P. rosea*) first made a hole in a tree of *Andromeda ovalifolia*, but after a few days left it; in a week or so it came back and again took possession, but was shortly after driven out by *Picus brunneifrons*. In three or four days, however, the latter also left it, and then commenced boring in quite a different direction and near

some servants' houses, where it selected the hard oaken gate-post of a wheat-field, immediately on a public road, along which servants and cattle were passing and re-passing hourly. The hole was bored within 2 or 3 inches of the summit of the post, which was about 5 feet high; the fine rotten chips within were strewed on the bottom, and upon these four fleshy-white eggs were laid; these, by cutting a small hole at the back, were taken out at a depth of 5 inches. When cleaned of the contents the fleshy tint was lost, and the eggs became of an opaque white. Diameter 0·87 by 0·6 inch."

The eggs of this species are of the usual somewhat lengthened and pointed oval form, pure white and glossy, and very slightly larger than those of *D. mahrattensis*. The eggs are slightly larger, and as a rule a good deal narrower, than those of the Lesser Spotted Woodpecker (*D. minor*) of Europe; sometimes, however, short oval varieties occur.

I have very few eggs of this species now by me; these vary in length from 0·86 to 0·98 inch, and in breadth from 0·64 to 0·73 inch.

***Liopicus mahrattensis* (Lath.). The Yellow-fronted Pied Woodpecker.**

Picus mahrattensis, Lath., *Jerd. B. Ind.* i, p. 274; *Hume, Rough Draft N. & E.* no. 100.

The Yellow-fronted Pied Woodpecker (to the best of my belief) breeds throughout India in the plains and up to an elevation of about 2500 feet.

I myself have always found the eggs in March, but I have known eggs taken in February and April.

I do not think it has any choice of trees; I have found its nest in a dozen different kinds, but as a rule the stem or branch in which it excavates its hole is partially decayed.

The following one of many notes, recorded when I was at Etawah, is all perhaps that I need say further about the nidification of this species, except that the number of eggs is almost invariably three:—

"On March the 30th took this bird sitting on three nearly fresh, delicate, pyriform, alabaster-like eggs, which, when unblown, were quite pinkish. The bird had made a hole on the underside of a branch; the hole was about 1·5 inch in diameter, and about 14 or 15 inches below the entrance the eggs were laid on the chips of the wood made in excavating the hole. The branch, which was only partially decayed, was about 10° out of the perpendicular, and the tree a moderately-sized baobab. Other baobabs were sparingly scattered over the ground, and 200 yards off was a thick mango grove, which one would have thought would have been preferred."

The late Captain Beavan said:—"A female with three white

eggs was taken from a hole in an 'Asun' tree (*Terminalia alata*), and brought to me at Baramussia on the 5th March. There was no nest. The eggs are slightly elongated, 0.75 inch long by rather more than 0.62 inch broad."

These eggs were probably not carefully measured with calipers, the dimensions given being abnormally small.

Messrs. Davidson and Wenden, writing of the Deccan, remark:—"Commonest in suitable localities, and certainly breeds."

Mr. Benjamin Aitken says:—"On the 26th May, 1873, I was much surprised to see a pair of these common little Woodpeckers evidently at home on the slope of the hill of Singurh, near Poona, and over 4000 feet in elevation. The hill-side was utterly scorched up, there being nothing with leaves, and no tree over 8 feet in height nearer than the plain below. The birds were flitting about the cactuses and other leafless stunted bushes which formed all the remains of the previous year's vegetation."

Colonel E. A. Butler notes:—"I received an egg from Mr. J. Davidson taken in Khandesh, 29th February, 1881."

The eggs are glossy white, and in shape a rather lengthened oval. When fresh and unblown they have a delicate pink shade, due to the partial transparency of the shell. This is common to a great majority of the birds of this family. In size they differ little from those of the Lesser Spotted Woodpecker of Europe, but they are less spherical than those eggs usually are, and though sometimes fully as long or even longer, are never, I think, nearly as broad.

In length they vary from 0.82 to 0.95 inch, and in breadth from 0.63 to 0.7 inch; but the average of a large series is 0.87 by 0.68 inch.

***Yungipicus pygmæus* (Vig.).** *The Himalayan Pigmy Woodpecker.*

Yungipicus pygmæus (Vig.), *Jerd. B. Ind. i*, p. 277; *Hume, Rough Draft N. & E.* no. 163.

I know nothing personally of the nidification of the Himalayan Pigmy Woodpecker.

Mr. R. Thompson tells me that "it lays in April and May, in holes of trees, in the dense forest districts of the Bhabur and the lower Kumaon Valleys. The young birds are able to fly in June; four to five in number usually to each old couple. The birds migrate into cultivated districts in the winter."

***Yungipicus hardwickii* (Jerd.).** *The Indian Pigmy Woodpecker.*

Yungipicus hardwickii (Jerd.), *Jerd. B. Ind. i*, p. 178.

Yungipicus nanus (Vig.), *Hume, Rough Draft N. & E.* no. 164.

Common as the Indian Pigmy Woodpecker is in the plains of Upper India, I have only once seen a nest, and have never myself

taken the eggs. It breeds in March, making a tiny hole, the entrance to which is about 1·25 inch at most in diameter, in some large more or less decayed branch of a tree. The nest I found in April, and which contained four young birds, was in a huge arm of a mango-tree in Futtehgurh, and I have notes of nests found in a seeshum and a sirris tree.

The egg of this species is, to judge from the only two specimens I possess, unusually spherical for a Woodpecker and large for the size of the bird. It is a very broad oval, pure white, and moderately glossy. Much the same shape as the egg of *Arumnus innominatus*, but less glossy, and intermediate in size between it and the eggs of *D. macii*.

The two eggs measure 0·7 by 0·6 inch, and 0·73 by 0·62 inch.

The late Captain Cock sent me the following note :—"I observed a pair of these little birds about a mango-tree on the outskirt of a small tope near Seetapore, and with the glasses made out they were bringing food to their young. Though I had found the tree upon which the nest was it was another thing to find the nest on a tree where there were many dead boughs and many holes of Barbets. After sawing off one bough fruitlessly I found the real nest. It was placed in a dead bough, the hole being about 1 foot from the end and facing inward toward the stem of the tree, so as not to be visible from below. I sawed through the bough with a small hand-saw about 6 inches below the entrance, and laid bare the nest-cavity, which contained two young ones and one addled egg, which I joyfully appropriated. The bough was not 4 inches in diameter, and was dead, the top having been broken off; the nest-cavity was very small, the two young being a tight fit; the egg was underneath them upon some wood-chips. A native brought in another egg with a female bird which he had caught upon it when I was at Allahabad in May 1875; this egg I adopted unhesitatingly, as there is no mistaking the egg, it is such a funny little blunt oval. The nest at Seetapore was taken on the 25th March, 1875.

"With rare Woodpeckers the egg-collector should always lift up the young when there are young in the nest, as an addled egg is often found with them in the nest."

Mr. George Reid, writing from Lucknow, says:—"I found a nest of this species and two fresh eggs on the 24th March. The nest was placed about 8 feet from the ground, in a horizontal and internally decayed (but not hollow) bough of a mango-tree in a neglected garden in the native city of Lucknow. The entrance-aperture, on the underside of the bough, was about $\frac{1}{2}$ of an inch in diameter, gradually widening to the egg-cavity, about 10 inches away towards the trunk of the tree. The eggs were white, and measured respectively 0·7 by 0·53 and 0·7 by 0·52 inch."

The egg of this species obtained at Seetapore by Captain Cock on the 25th March measured 0·69 by 0·52.

Yungipicus gymnophthalmus* (Blyth). *The Southern Pigmy Woodpecker.

Yungipicus gymnophthalmus (Blyth), *Hume, Cat. no. 164 bis.*

Mr. H. Parker writes from Ceylon :—

“*Feb. (Tissa), July (Vil.)*. A nest of this Pigmy Woodpecker was in a hole 10 feet from the ground in a dead branch 3 inches thick. The entrance was circular and 1 inch in diameter. The cavity was excavated down the branch for 8 inches, and was 2 inches by $2\frac{1}{4}$ inches wide. Two eggs were lying on the bare wood. A second nest contained three eggs; they are very blunt ovals, and are pinkish when quite fresh, but become pure white when cleaned out. Average size 0.62 inch by 0.53 inch.”

Colonel Legge writes, in his work on the Birds of Ceylon :—

“In the Western Province this Woodpecker breeds in February and March, nesting in holes in small branches. A nest which Mr. MacVicar found in the Colombo District, near Poré, was in a dead branch with an opening leading to it of about 1 inch in diameter. There were three young birds in it, just hatched, and the egg-fragments were shining white.”

Micropternus phaeiceps*, Blyth. *The Rufous Woodpecker.

Micropternus phaeiceps, Blyth, *Jerd. B. Ind. i, p. 204*; *Hume, Cat. no. 178.*

From Sikhim Mr. Gammie writes :—“I have taken the eggs of this Woodpecker on four occasions—twice in April and twice in May—and each time out of the middle of an ants’ nest. One of the ants’ nests was suspended to a bamboo growing in dense jungle at about 2000 feet; the other three were hanging from branches of small trees growing in the narrow strips of jungle left uncut along the sides of nullahs in cultivated places. They were all within 6 to 10 feet of the ground. These ants’ nests, which are of a globular shape, somewhat resembling the nest built by one of the European wasps (*Vespa britannica*, I think), are exceedingly common in Sikhim up to 3500 feet, and uncommonly comfortable-looking breeding-quarters they make. Whether the presence of the Woodpecker causes the ants to desert their nest, or whether the birds take possession of deserted nests only, I am at present unable to say. Certainly they are most inveterate enemies of this particular species of ant, and appear to feed almost exclusively on it. Those I have dissected had their stomachs crammed with them. The bird has a peculiar persistent smell about it, which may either be caused by its peculiar diet or it may arise from a secretion provided by nature to protect it from being bitten by the ants and to force them to vacate their nest when the bird comes to take possession. The first nest I found contained but one egg, probably laid that

morning, and the ants were swarming about it and running up and down the bamboo to which it was suspended. Not unlikely they were moving to other quarters. About the other three nests there was not a single ant, but they had evidently been longer appropriated by the intruders, and the original owners had had time to 'flit.' The nests were all in an excellent state of preservation, and did not have the appearance of having been long deserted by the ants. The Woodpeckers had excavated their entrances in the side, and hollowed out a cup-shaped cavity for their eggs in the middle.

"Three appears to be the full complement of eggs."

Certainly, the nest of this species is one of the most remarkable that I have ever seen. From the end of a mango-branch ants of some species had constructed a huge nearly globular nest about 13 inches long and 11 in diameter, involving, as these nests commonly do, all the leaves and twigs springing from that part of the branch. The nest is a grey-brown mass of a half felt-like, half papier-mâché-like substance; into this the Woodpecker had bored a circular entrance about 2 inches in diameter, and inside it he had scooped out a circular cavity some 5 inches in diameter.

The eggs are elongated ovals, in some cases excessively elongated, but always obtuse even at the small end. The shell is extremely thin and fragile, and entirely devoid of gloss.

In length they vary from 1.08 to 1.26, and in width from 0.72 to 0.8; but the average of five eggs is 1.16 by 0.7 nearly.

Brachypternus aurantius (Linn.). *The Gold-backed Woodpecker.*

Brachypternus aurantius (Linn.), *Jerd. B. Ind.* i, p. 295; *Hume, Rough Draft N. & E.* no. 180.

The Gold-backed Woodpecker breeds all over the plains of India during March and April, and again during June and July; but I have never known them breed in the Himalayas at a greater altitude than 3000 feet.

I think that in the plains the mango is the tree in which they prefer to bore their nest-holes. These latter vary in diameter from 2.5 to 3.5 inches, run in horizontally for from 3 to 6 inches, and then turn downwards. Where the downwards shaft is bored by the bird, it is rarely above 8 or 9 inches in depth; but where, as often happens, the bird cuts into a natural cavity the eggs may be found as much as 3 feet below the orifice. Where entirely excavated by the birds, the chamber is about 5 to 6 inches in diameter, but I have found the eggs at the bottom of a huge cavity a couple of feet across.

There is no nest; the eggs, the normal number of which is three, are laid upon a few chips of wood.

Mr. W. Blewitt says:—"I found three fresh eggs of this species on the 17th July in a hole in a sirris tree situated on the canal-

bank near Hansie. The hole was about 17 feet from the ground, and contained no lining of any kind, the eggs being laid on the bare wood chips."

Colonel G. F. L. Marshall, writing from Saharunpoor, remarks:—"The bird is very common here. I found a nest early in June in a hole in a mango-tree, the orifice about $3\frac{1}{2}$ inches in diameter and the hole about 8 or 9 inches deep; the orifice was concealed by a small spray growing out of the main trunk just beside it, and was about 20 feet from the ground. There were three eggs, oval, shining, white after being blown, and with a pale salmon tinge before blowing; they were laid on the small chips at the bottom of the hole, which had no other lining whatever."

I have found the nest-holes at all heights from the ground from 3 to 40 feet.

Sometimes a natural hollow is taken possession of and only rounded off internally.

Both sexes assist in incubation. I find the following amongst my notes:—

"On the 23rd of March I caught a bird (a male) in its hole, with two fresh eggs, very pyriform, and now when blown just like highly polished alabaster. I had the live bird 24 hours in a box, and when I popped him on to the trunk of the large peepul tree overhanging my portico, instead of flying away he ran about 1 foot up the tree and, taking no earthly notice of me, set to work devouring black ants at a great rate; whilst in the hand he erected his crest, screamed lustily, and pecked most vigorously at my fingers, or indeed anything put near him; he was a very bold bird."

And, again:—"Brooks took a nest, if I may use the expression, on the 12th of March, out of a mango-tree near the Line; ten days previously we had seen the bird fly out of the hole, and had much enlarged the opening so as to allow a boy to introduce his arm. Yet, after all this, the bird still laid its eggs there. I caught a bird near Oreyah on the 11th of March, in an excavated hole about 3 feet from the ground, in the trunk of a mango-tree. There were three very delicate white eggs, quite fresh, showing pinkish and somewhat orange where the yolk was, till blown, but pure white, very glossy, and like polished alabaster when blown. They were very thin-shelled, rather long and pyriform, not a pin to choose between them. There was no nest; the eggs were laid on the wood chips."

Mr. George Reid, writing from Lucknow, says:—" *B. aurantius* breeds, I believe, twice a year—first in March and April, and again after the rains set in. I have on two occasions found its nest, but could not get at the eggs without cutting into, and probably destroying, the large mango-trees they were in."

Colonel Butler remarks:—"Mr. J. Davidson sent me an egg taken in the Satpura, Khandesh, 8th March, 1881."

Typically these eggs are a lengthened pyriform oval when un-

blown and fresh, suffused with a delicate salmon-pink hue, but when emptied of their contents milk-white and generally highly glossed. They remind one much of those of the Great Spotted Woodpecker, but are always longer, though seldom broader, and often slightly narrower, than the eggs of the European species. One or two of the eggs I possess are precisely of the size and shape of the White-rumped Woodpecker's, as figured by Bree. They are not unfrequently very obtuse at both ends.

The eggs vary in length from 1 to 1·2 inch, and in breadth from 0·77 to 0·85 inch; but the average of twenty eggs is 1·11 by 0·8 inch.

Brachypternus erythronotus* (Vieill.). *The Red-backed Woodpecker.

Brachypternus ceylonus (Forst.), *Hume, Cat.* no. 182 bis.

Colonel Legge remarks:—"In the south of Ceylon the Red Woodpecker breeds from February until June, and not unfrequently nests in the trunk of a dead coconut-tree, cutting a round entrance and excavating the decaying part of a tree for some distance below it. I have never been able to procure the eggs, although the bird is so common."

Tiga javanensis* (Ljung). *The Lesser Three-toed Woodpecker.

Chrysonotus intermedius (Blyth), *Jerd. B. Ind.* i, p. 200.

Chrysonotus rubropygialis (Malh.), *Jerd. B. Ind.* i, p. 200.

Tiga javanensis (Ljung), *Hume, Cat.* no. 184.

Tiga rubropygialis (Malh.), *Hume, Cat.* no. 185.

Mr. Oates, writing from Pegu, says:—"On the 7th May I got three eggs, quite fresh, from the hole of a tree. The hole appeared to have been a natural cavity, but the entrance had been enlarged and made circular. The nest was at no great height from the ground.

"The three eggs are pure white, and very glossy and smooth. They are extremely pointed at one end. They measure 1·1 by 0·77, 1·07 by 0·71, and 1·09 by 0·75."

Major C. T. Bingham records the following note from Tenasserim:—"The commonest of common Woodpeckers in the Thoungyeen as elsewhere over the country. I subjoin a note of a nest and eggs I found. It was the 22nd March, 1879, and a frightfully hot day. I was returning to camp, and my road lay through some dry already burnt eng (*Dipterocarpus*) jungle. Passing close to a small stunted pyna tree (*Lagerstrœmia flos reginae*) a Woodpecker flew out of a hole on the side nearest to me, nearly hitting my face as it flew, and perched, or rather struck, as they do, on a tree not

far off. Keeping my eye on her I got one of the peons with me to widen the hole and see whether there were any eggs. In a few moments he announced three. I then shot the bird, which proved to be the above-mentioned Woodpecker, a female. The three eggs were translucent whity pink and rather glossy, laid on the decayed wood in a natural hollow, a passage to which the bird had cut from the outside at only 4 feet from the ground. It was a wonder that when the jungle was fired they had not been roasted."

These three eggs measured 1.18, 1.19, and 1.11 in length, and were uniformly 0.8 in breadth.

Mr. Frank Bourdillon obtained the eggs of this species in the Assambo Hills in Southern India. He says :—"Of this bird two eggs, of which I send a single specimen, were taken hard-set on March 23, 1873. The eggs are white, somewhat elongated, and polished, and measure 1.88 inch long by 0.68 broad and 1.12 long by 0.75 broad. The nest, of dead leaves and chips of wood, was in a hole some 2 feet deep and 30 feet from the ground, hollowed out by the bird itself, or rather by the pair, for the cock and hen used to take it in turns to work at the cutting."

The egg is a typical Woodpecker egg, a much-elongated oval, a good deal pointed towards one end; the shell thin, glossy, and pure white.

Writing of another nest, he says :—

"March 29th, 1873. We obtained two eggs of this bird, which were deposited in a hole excavated by the bird at a depth of about 2 feet. The eggs were slightly set, and are very similar in shape to those of an English Swift."

The eggs, like those of all this group of Woodpeckers, vary a good deal in shape, and are rather regular moderately elongated ovals or somewhat broader and somewhat pyriform or somewhat pointed at the small end. They are white, more or less pure according to their degree of freshness, and have a more or less amount of gloss accordingly.

***Chrysocolaptes festivus* (Bodd.). The Black-backed Woodpecker.**

Chrysocolaptes goensis (Gm.), *Jerd. B. Ind.* i, p. 282.

Chrysocolaptes festivus (Bodd.), *Hume, Cat.* no. 167.

Mr. J. Davidson makes the following remarks regarding the Black-backed Woodpecker in Western Khandesh :—"Permanent resident. Moderately common through the Satpuras, Western Nandurbar, and the Pimpalnr Ghats, but does not seem, like *Brachypternus aurantius*, to come down to the plains. It breeds very early in November, December, and January. The first pair I noticed were at Taloda in December 1879. I shot the male, not noticing that they had just finished excavating a hole. Next year

I found a pair of birds still there. They had made at least five or six new nest-holes in rotten stumps, but had not laid. I had all the holes examined every Monday, but the birds deserted the spot. The only egg I obtained was sent to me early in January from a nest in the Satpuras, in a hole in a tree in which the bird had bred the year before. Two nests, found near Shirpur at Christmas 1880, each contained one young one just able to fly. The young were very handsome, the crest being flame-coloured. They seem to breed, as a rule, every year in the same immediate neighbourhood, but almost always, I think, in a new hole. They only lay one egg I think, and certainly I have never seen the old ones accompanied by more than one young bird."

***Chrysocolaptes gutta cristatus* (Tick.).** *The Southern Golden-backed Woodpecker.*

Chrysocolaptes sultaneus (Hodgs.), *Jerd. B. Ind.* i, p. 281; *Hume, Cat.* no. 166.

Chrysocolaptes delesserti (Malherbe), *Hume, Rough Draft N & E.* no. 166 bis.

Messrs. W. Davison and J. Darling inform me that the Southern Golden-backed Woodpecker breeds in the Nilghiris, at elevations of from 5500 to 7000 feet. It lays in December, January, and February in large holes, which it excavates for itself in the trunks of trees at all heights from 6 to 60 feet above the ground.

The bird lives all the year round in these holes, and when not disturbed lays year after year in the same hole.

The nest-hole is about 3 inches in diameter at the entrance, runs in horizontally for a few inches, then turns straight down for another few inches, and then widens out into a chamber some 6 inches in diameter.

Neither of these gentlemen has ever found in any nest more than one egg, and they describe these latter as rather broad ovals, pinky white, with deader white streaks when unblown, pure white when blown, and in both states very glossy.

I have received no eggs and no exact measurements.

***Chrysocolaptes stricklandi* (Layard).** *Layard's Woodpecker.*

Chrysocolaptes stricklandi (Layard), *Hume, Cat.* no. 166 ter. *

Colonel Legge remarks, in his 'Birds of Ceylon':—"I know nothing of the eggs of this species, but can state that in the hills it breeds at the beginning of the year, as I once found the nest at Elk Plains in January. It was situated in a hole in rather a small limb high up in a large tree, and the birds by their gestures appeared to have young."

Hemicercus canente* (Less.). *The Burmese Heart-spotted Woodpecker.

Hemicercus canente (Less.), *Hume, Cat. no. 165 bis.*

Mr. J. Inglis writes from Cachar:—"This Woodpecker is rather rare, I have shot some six specimens at different times of the year. On the 18th March, 1876, I found a nest of it containing two young birds. The nest was in the trunk of a solitary tree in the Tea-Garden, about 9 feet from the ground. I caught the female as she came out of the hole. After releasing her she flew straight off to the jungle, but returned to feed the young quite boldly within half an hour."

Major C. T. Bingham sends me the following note from Tenasserim:—"Not very plentiful in the Thoungyeen jungles, but I have seen this bird from the head-waters of the stream nearly to its mouth.

"On the 11th March, 1880, I cut out a nest-hole of the above species out of the dead and decaying trunk of a large teak-tree, at a height of about 12 feet from the ground, on the bank of the Meplay choung. I had watched the bird for two days previously going in and out.

"The entrance to the nest was a little more than an inch in diameter, the tunnel, passing rather obliquely downwards for about 18 inches, ended in a large hollow, the bottom of which was strewn with broken bits of decayed wood, on which reposed two dull white bluntish eggs. These measure respectively 0·87 by 0·65 inch, and 0·90 by 0·70 inch. I managed to catch the female on the nest."

Mr. W. Davison was, I believe, the first to find the nest of this Woodpecker. He says:—"On the 16th December, 1873, while on my road up to Pahpoon (Salween District, Tenasserim Provinces), and about 100 miles north of Moulmein, I found a nest of this small Woodpecker. The hole was small, not round, as is usually the case with Woodpeckers' nests, but somewhat oval, the major axis being perpendicular and about 1 or 1·25 inches. It was placed in a small limb (about 6 inches in diameter and about 40 feet from the ground) of a huge dry tree standing in the middle of a Karen clearing.

"The nest contained, as I afterwards found, one egg which was slightly incubated.

"I drove the bird from the nest twice, and as she was about to enter it a third time shot her.

"As I was unable to climb the tree, or to send any one to do it at the moment, and being rather pressed for time, I left a Karen with instructions to cut the branch carefully and bring it to me; but he, instead of doing so, cut open the hole and brought me only the egg. He declared that there was nothing in the hole in the shape of a nest beyond the few dry chippings of wood usually found in such cases."

The egg is a moderately elongated oval, slightly compressed towards one end, but very obtuse at both. The shell is very fine and smooth and fragile, but has only a little gloss. It has doubtless been pure white, but, whether in blowing it or how I cannot say, it has been much soiled, and is, except at the ends, tinged with a dingy creamy tint. It measures 0·9 by 0·7 inch.

Mr. J. Darling, Jun., found the nest further south, in the Malay Peninsula. He writes:—

“*Near Kossoom, July 2nd, 1879.* Three days ago, while after birds, I passed a dead stump, and on looking up saw the head of a Woodpecker peeping out of a hole. I set the bird flying and missed it. I followed it up, but failed to find it again.

“After waiting a long time, and the Woodpecker not putting in an appearance, I went home, determined to have the nest next morning. Two days’ fever and three nights’ bad sleep, however, kept me from getting to the place at once; but when I got there, some three miles from home, I was lucky enough to find the Woodpecker with its head out of the hole, and shot it thus, pulling it out dead.

“Cutting out the nest, I found two eggs quite fresh laid on a lot of chips of wood.

“The nest was of the ordinary type of Woodpecker’s; the entrance a circular hole, $1\frac{1}{2}$ inches in diameter, going inwards 4 inches, then going downwards $6\frac{1}{2}$, and terminating in a chamber some 5 inches in diameter.

“The nest was 6 feet from the ground, in a dead stump in sparse bamboo- and tree-jungle, alongside (some ten yards from) a much-frequented path, and in very low-lying country not much above high-flood tide.”

These two eggs measured 0·91 by 0·67 and 0·9 by 0·67.

Several eggs of this species are all of the same type, somewhat elongated ovals, apparently always very obtuse at both ends, sometimes slightly pyriform. The shell very fine and glossy. Originally, no doubt, white, but in all the specimens I have seen much soiled with creamy clouds extending almost over the entire surface of the egg.

***Hemilophus pulverulentus* (Temm.).** *The Great Slaty Woodpecker.*

Mulleripicus pulverulentus (Temm.), *Jerd. B. Ind.* i, p. 284; *Hume, Cat.* no. 168.

Major C. T. Bingham found the nest of this large Woodpecker in Tenasserim. He says:—“Last year during the rains I found that one of the very largest kanyin trees (*Dipterocarpus alatus*) had been blown down and formed a very convenient bridge over the Winsaw chuong below the village of Boolooway in the Lower Thoungyeen. The road over this part of the Winsaw not being much used, I found that a pair of *Mulleripicus pulverulentus*

bored a hole into the side of the tree. It was $3\frac{1}{2}$ inches in diameter, extended for about a foot inwards, and then for about 8 inches downwards, and contained on the 30th of April two fresh, rather glossy white eggs, measuring $1\cdot41 \times 1\cdot11$ and $1\cdot41 \times 1\cdot12$ respectively. There was no lining to the nest, the eggs resting on the bare wood.

"The eggs are very broad ovals, but markedly pointed towards the small end."

The eggs are in shape very broad ovals, conspicuously pointed towards the small end. The shell is extremely fine and compact and has a conspicuous gloss. In colour they are, of course, pure white when first laid, but become a little soiled and stained as incubation proceeds.

Subfamily IYNGINÆ.

Picumnus innominatus, Burt. *The Speckled Piculet*.

Vivia innominata (Burton), *Jerd. B. Ind. i*, p. 300; *Hume, Rough Draft N. & E.* no. 186.

I have never found the nest of the Speckled Piculet. Mr. R. Thompson says:—"They breed in April and May, in small holes in trees, usually in one of the thicker branches, which they excavate themselves.

"Very common at altitudes of 1500 to 3000 feet. This is a very interesting species, because of the numbers of individuals usually constituting a family; there are sometimes as many as seven young ones. I have seen as many. They are capital insect hunters, and destroy vast quantities of the eggs and larvæ of xylophagous beetles."

From Sikkim Mr. Gammie writes:—"This year I found two nesting-holes of the Speckled Piculet, both in April, in the outer edge of large forest, at 5000 feet elevation. They were in decaying stumps of small trees, about three feet from the ground, and had been made by the birds. The entrance was only an inch in diameter, and the hole was $3\frac{1}{2}$ inches deep, and little more than an inch wide. There was no nesting-material. Each contained three fresh eggs."

In length the eggs vary from 0·53 to 0·61, and in breadth from 0·45 to 0·51; but the average of six eggs is 0·58 nearly by 0·49 nearly.

Colonel G. F. L. Marshall writes:—"On the 20th April I found a nest-hole inhabited by this species at Mungoli near Naini Tal at an elevation of about 4000 feet above the sea. It was a tiny circular hole that had been cut out by the birds themselves in a soft-wooded tree. The entrance was less than an inch in diameter; the chamber was about two inches in diameter and three inches deep. The hole went straight into the centre of the tree, which

was rotten, and in the rotten wood the chamber was hollowed. It was in a vertical bough that had been broken off about five feet above the nest, and the entrance was just below a knot and about ten feet from the ground. The tree had rather dense foliage on the living branches, and was growing on a steep hill-side. The nest contained two eggs, which hatched while I was in the act of enlarging the hole; they were large for the size of the bird, nearly round, and shining glossy white. The normal number of eggs, so far as this group is known, is two, and in this nest, if there had been more than two young, they would have had a severe time of it. The parent birds were not shy."

Captain Unwin found a nest-hole in a dry fir-tree in the Agrore Valley on the 6th May, 1871. It contained three transparent white eggs, which he sent me; they were laid on the bare wood of the hole.

These eggs are quite of the Woodpecker type; when blown pure white and very glossy, with a thin fine shell; a delicate salmon-pink, as Captain Unwin noted, when fresh and unblown, owing to the yolk showing through. They are very broad ovals, scarcely smaller at one end than the other.

They varied from 0.58 to 0.61 in length, and from 0.49 to 0.51 inch in breadth.

A precisely similar egg, taken from a hole in a large tree only about five feet from the ground, was recently sent me from Sikkim. It was taken in June in one of the low valleys running into the Teesta, and measured 0.59 by 0.49.

Sasia ochracea, Hodgs. *The Rufous Piculet.*

Sasia ochracea, Hodgs., *Jerd. B. Ind.* i, p. 301; *Hume, Cat.* no. 187.

A single egg of the Rufous Piculet was sent me from Sikkim, where it was obtained in June in one of the valleys below Darjeeling, together with the nest—in other words, the joint of the bamboo which the bird had selected for laying in. The bamboo has an external diameter of 3.25 inches, and a little less than 2.5 interiorly. It was a dry one, and into this, at a height of about 3 feet from the ground, and 6 inches above the joint, the bird had pierced a small circular hole. Interiorly it had grooved with its little bill the whole inner surface of the lower surface of the compartment, and the little long fibrous strips thus obtained were collected at the bottom to form a bed for the eggs.

Only one egg was found, a moderately broad oval (more oval than the eggs of *P. innominatus*), pure white, and with scarcely any gloss, though the shell is excessively smooth and compact. This egg measures 0.63 by 0.48.

From Sikkim Mr. Gammie writes:—"A nest-hole of the Rufous Piculet found at 4000 feet on the 2nd July, much resembled those of *Picus innominatus*, but was an inch deeper and half-an-inch wider. It was within three feet of the ground, in a soft decaying

stump of four or five inches diameter, and had been excavated by the birds themselves. It contained two partially-set eggs. I killed the male off the eggs. Its stomach contained a good-sized grub and a few coleopterous insects. I have observed this bird as low as 1500 feet, so that it probably breeds down to that low elevation."

Four eggs sent me from Sikhim varied in length from 0·6 to 0·65, and in breadth from 0·48 to 0·51.

Lynx torquilla, Linn. *The Wryneck.*

Yunx torquilla, Linn., *Jerd. B. Ind.* i, p. 303; *Hume, Rough Draft N. & E.* no. 188.

I have no particulars as to the nidification of the Wryneck, but Mr. Brooks says that it "breeds in the large orchard at Ramu, Cashmere, where it is not unfrequent."

Family CAPITONIDÆ *

Megalaima marshallorum, Swinh. *The Great Indian Barbet.*

Megalaima virens (Bodd.), *Jerd. B. Ind.* i, p. 308.

Megalaima grandis (Gould), *Hume, Rough Draft N. & E.* no. 191.

The Great Indian Barbet breeds in various parts of the Himalayas, at any rate from Bhotan to Cashmere, in deep shady dells in all the lower hills south of the first Snowy Range, at elevations of from 4000 to 6000 feet. It lays from the middle of May until the middle of July. Throughout the breeding-season its loud wailing cry resounds in all the warmer well-wooded valleys.

The nest-holes excavated by the birds, alike in the trunks and larger branches of the softer-wooded trees, occur at heights of from 10 to 50 feet from the ground.

The *Alnus nepalensis* and *Acer oblongum* are in some parts of the hills their favourite trees. The holes are some 3 inches in diameter at the entrance, only a few inches deep, and 6 or 7 inches across, where the eggs are laid. Often they go straight into a natural hollow.

The normal number of eggs is four, but I have a note of five being found.

According to Mr. Hodgson's notes, this species begins to lay in April in Nepal, excavating a nest-hole in the trunks or branches of trees 4 or 5 inches deep, and laying three or four eggs, which

* For the Barbets I employ the nomenclature of the forthcoming volume of the Catalogue of the Capitonides in the British Museum by Captain G. K. Shelley, who has kindly assisted me.—Ed.

are figured as pure white, and as measuring 1.35 by 0.98 inch; it is added that this species breeds only once a year.

He further notes as follows:—"May 20th, in a deep ravine descending from the heights of the Shahpooree forests, I obtained a female and nest in the decayed trunk of a large tree, or rather I found the hollow which served as nest-hole. This is similar to that of the smaller green species (*M. hodgsoni*), and the eggs are white like those of that species, but larger."

Mr. R. Thompson writes:—"This Barbet usually rears from three to four young ones. Fruit is its only food, so far as I know. It is easily tamed, and, when caged, often utters its loud and plaintive cry. The hillmen have a story, that a person who suffered unjustly from law-suits and who died from grief in consequence was transformed into this bird, of which the cry is *un-nee, ow*; *un-nee, ow*; meaning injustice, injustice!"

Writing from Murree, Colonel C. H. T. Marshall remarks that this species "lays in the latter end of June and beginning of July; the eggs are four in number, pure white, and 1.4 by 1 inch. Most of the nests were in newly-made holes in horse-chestnut trees, some 20 or 30 feet from the ground. Elevation averaging 6000 feet."

Colonel G. F. L. Marshall remarks:—"This species is a late breeder at Naini Tal, not laying, so far as I know, till the end of June. On the 23rd June I found a nest at about 7000 feet elevation; it was in an oak-tree at the side of an unfrequented road, about 20 feet from the ground. The old bird was very wary, leaving the nest noiselessly whenever I approached within twenty yards, and never returning as long as I remained anywhere near the tree.

"The tree was rotten inside, and about 3½ feet in girth; the hole was pierced through the green wood into the hollow in the vertical trunk, and contained three fresh eggs; it was about a foot deep vertically."

The eggs vary a good deal in shape; typically they are somewhat lengthened ovals, regular and somewhat obtuse at both ends, but much elongated, comparatively broad, and somewhat pyriform varieties occur. They are a dull pure white, with little gloss, as compared with those of Woodpeckers.

They vary in length from 1.25 to 1.48 inch, and from 0.89 to 1.05 inch; but the average of eleven eggs measured is 1.37 by 0.98 inch.

Megaloma virens (Bodd.). *The Great Chinese Barbet.*

Megaloma virens (Bodd.), *Hume, Cat. no. 191 bis.*

Major C. T. Bingham found the nest of this species in Tenasserim. He says:—"On the 12th February, on the bank of the Mekhney chong in the Thoungyeen Valley, I found my first nest of this bird. It was in a hole of a jungle tree, name unknown,

at a height of about 30 feet from the ground. Not made, as many Barbets' nests are made, on the underside of a branch, but bored into the upright stem for about 3 inches, terminating in a natural hollow, at the bottom of which, on the bare wood, lay three fresh eggs, broad ovals, dull white, but only here and there with faint traces of a gloss. A second nest of the 3rd of March at Meeawuddy contained two young ones.

"A third, found on the 26th March on the bank of the Maigla chong, contained one young one, apparently just hatched, and one very hard-set egg. This was in a hole in a dead teak-tree, at about 20 feet from the ground, and was, like the first, an entrance bored into a natural hollow, which was unlined.

"I am glad to say that, though the getting-out of the egg necessarily enlarged the entrance-hole, the birds did not desert their young one, for I saw them feeding it the next day. The four eggs procured measured 1.35×1.06 , 1.30×1.05 , 1.32×1.05 , and 1.37×1.01 ."

The eggs are in shape broad ovals, always somewhat, often conspicuously, pointed towards the small end. In colour they are pure dull white, with only here and there in some eggs a faint trace of gloss.

Cyanops asiatica (Lath.). *The Blue-faced Barbet.*

Cyanops asiatica (Lath.), *Jerd. B. Ind.* i, p. 313; *Hume, Rough Draft N. & E.* no. 195.

Mr. R. Thompson says:—"The Blue-throated Barbet breeds in April and May, digging out holes in the decayed branches of trees.

"It is a common breeder in our Kumaon forests, keeping *entirely* to the hilly regions. 'Kuttooruk, kuttooruk, kuttooruk' is its cry."

Mr. Blyth tells us that in Lower Bengal it has two broods, one in the month of May, the other in November.

Colonel G. F. L. Marshall says that his shikaree found a nest-hole in Kalsi Grove (Dehra Doon). "The entrance was on the underside of a bough about 15 inches in girth, and near the top of the tree. The hole was circular and about 10 inches in depth."

Several nests found in May in the neighbourhood of Darjeeling each contained three fresh eggs. One was in a hole in a large tree about 6 feet from the ground; two others were in holes in large branches of trees. The one first mentioned had a large pad of shavings, apparently taken off by a plane, and collected by the birds. The others had scraps of decayed wood as a bed for the nest.

Another nest-hole found in July, containing three fresh eggs, had also in it a large pad consisting almost exclusively of coarse vegetable fibre, apparently strips of the bark of some herbaceous plant, but a few pieces of grass, a piece of red wool, and one or two other similar miscellaneous scraps are intermingled in the pad.

Whether the Barbets can possibly themselves collect these pads, or whether they take possession of holes in which other species have already collected them, I have not been able to ascertain.

The eggs vary from rather broad to considerably elongated ovals, and are not uncommonly slightly pointed towards one end. The shell is fine and compact, and in some specimens has a slight gloss, in others is dull and almost entirely glossless. The colour is, of course, pure white.

In length the eggs vary from 1.03 to 1.13, and in breadth from 0.79 to 0.87; but the average of eight eggs is 1.09 by 0.83.

Cyanops davisoni (Hume). *Davison's Barbet.*

Megalasma davisoni, Hume; Hume, Cat. no. 195 bis.

Major C. T. Bingham writes from Tenasserim:—"This Barbet, allied very closely to *C. asiatica*, is common in the Thoungyeen valley, and I have shot it on the western side of the Dawna range, in the pass leading from Yunbine on the Salween to Koosaik near the mouth of the Thoungyeen. On the 16th March, while moving camp from the head-waters of the Moplay chong to some ten miles lower down the stream, I was fortunate enough to observe a Barbet of the above species leaving a hole in the underside of a large branch of a pyma tree (*Lagerstromia flos-regiue*). On sending up a man, who with ease enlarged the entrance in the half-rotten wood with a 'dah' or Burmese knife, he found two rather glossy white eggs resting on the bare wood. I found these slightly set. As soon as he announced that there were eggs, I shot the bird, which had flown to a neighbouring tree, and on which I had kept a watch.

"On the 20th of the same month a second nest was discovered for me by a Karen. This also contained two eggs, one of which, however, was smashed in getting it down. The nest-hole was in a teak-tree, and similar to the first, as were the eggs. The three eggs measure respectively 1.13 by 0.81 inch, 1.13 by 0.81, and 1.08 by 0.78."

The eggs of this species are of course pure white; all are slightly glossy, and some quite fresh ones have a fine gloss. In shape they are, perhaps, normally slightly elongated ovals, a little pointed towards the small end; but tolerably broad ovals occur, and others which are very obtuse at both ends and decidedly pyriform.

Cyanops flavifrons (Cuv.). *The Yellow-fronted Barbet.*

Megalasma flavifrons (Cuv.), Hume, Cat. no. 196 ter.

Colonel W. V. Legge writes from Ceylon:—"The eggs of this Barbet have been at last thoroughly identified. Mr. MacVicar, a gentleman in the Public Works Department, found two nests in the Western Province in the beginning of last May. This is the

breeding-season of all our Ceylon Barbets. The holes were bored in dead branches of the jack-tree, about 20 feet from the ground, and the eggs laid on the bare wood at the bottom of the cavity. They were two in number, pure white, smooth, and glossy, and of a slightly pointed oval shape. They measured respectively 1·06 by 0·82; 1·13 by 0·8; 1·13 by 0·82; 1·11 by 0·8. The identification of the birds was complete, as they were seen and shot."

Subsequently Colonel Legge wrote in the 'Birds of Ceylon':— "This Barbet has apparently two broods in the year, for the season of its breeding lasts from February until September. It selects usually a soft-wood tree, such as the cotton (*Bombax malabaricum*), and cuts a round hole into the heart of the branch or trunk, in which it excavates a cavity for its eggs some distance down from the entrance."

Cyanops franklini (Blyth). *The Golden-throated Barbet.*

Cyanops franklinii (Blyth), *Jerd. B. Ind.* i, p. 314; *Hume, Rough Draft N. & E.* no. 193.

According to Mr. Hodgson's notes, this species the Golden-throated Barbet, begins to lay in April, breeding in holes in trees in the central hills of Nepal and Sikhim and in the Terai. The nest-hole is about 10 or 12 inches in depth; the eggs, three or four in number, are pure white, and one that is figured measures 1·1 by 0·85 inch; a broad regular oval.

Mr. Mandelli has favoured me with an egg of this species taken at Ginzon the 5th August, at an elevation of about 3500 feet. The nest-hole was placed in a medium-sized tree at about 8 feet from the ground, and contained two fresh eggs.

The egg is a moderately broad oval, pure white, and with very little gloss, and measures 1·11 in length by 0·82 in breadth.

Cyanops caniceps (Frankl.). *Franklin's Green Barbet.*

Megalaima caniceps (Frankl.), *Jerd. B. Ind.* i, p. 310; *Hume, Rough Draft N. & E.* no. 193.

Franklin's Green Barbet breeds in richly-wooded, well-watered districts, especially in the neighbourhood of hilly ground or hills, finding its way up into the valleys of these to an elevation of some 2000 or 3000 feet, at any rate, all over Continental, as opposed to Peninsular India. It lays in March and April. At Bareilly I obtained fully-fledged young ones by the 20th of May; and Dr. King, writing from Mount Aboo, says he obtained them there on the 25th of that month.

Three or four is the usual number of eggs found, and these appear to be laid very irregularly, as quite hard-set and almost fresh ones are found in the same nest-hole. These latter, so far as I know, are always excavated by the birds themselves in the trunk or one of the larger branches of some soft-wooded tree, such

as the siris. In Bareilly we found no nest-hole at a less height than 20 feet, and one was at least 50 feet from the ground.

There is of course no real nest, the eggs being laid on the bottom of the hole amongst a few chips. The hole is comparatively small, not above 5 inches in diameter at bottom, from 6 inches to 2 feet deep, and the passage, which is very neatly cut and rounded, and nicely bevelled off at the entrance, is only about 2½ inches in diameter.

The late Captain Beavan mentions that in Maunbhoom this species breeds towards the end of March, and that at the beginning of April two young birds and an addled egg were brought him. In Upper India it does not, I think, begin laying until April.

Mr. George Reid writes from Lucknow:—"On the 23rd April and again on the 5th May I found nests of this species, each containing two fresh eggs. One nest was in a hole made by the birds in an old mango-tree, only about six feet from the ground, while the other was in a similar hole just about the same distance from the top of a tall jamun-tree."

The late Captain Cock wrote:—"This Barbet is very common at Sitapur in Oudh, its noisy continuous cries serving to remind one that the hot weather is again coming on. It makes its nest just like any other Barbet, but generally at no great height from the ground, and placed on the underside of a large bough. All that I have found had excavated fresh holes for their nests, selecting situations where the hard outer wood being penetrated, the interior wood was soft and easily worked; like *X. hamacephala*, a chamber is made in which, upon a few chips, three white, rather pyriform eggs are laid. It lays usually in April and the end of March. I have frequently caught the bird upon its eggs; they bite one's fingers rather hard unless a handkerchief be placed over them first. The holes are excavated in a wonderfully short space of time, considering the instrument the bird works with. I have watched the bird working continuously for some hours without stopping its work.

"Riding home through a thick mango tope opposite the Post-Office at Sitapur one morning early in June, I observed a Barbet looking out of a hole in a mango-tree. As the hole was only ten feet from the ground I sent for an axe and, stuffing my handkerchief into it to save the eggs should there be any, I soon had the pleasure of cutting down to three white fresh eggs. The interior of the hole had been hollowed out into quite a smooth round chamber. I may mention that I found another nest in the same tope of trees about a month previous, containing a fully-fledged young one."

Colonel Butler records the following note:—"I took a nest of Franklin's Green Barbet at Mount Aboo on the 8th April, 1875, containing four fresh eggs of a dull white colour. The nest-hole, which was a fresh hole and made by the birds themselves, was drilled upon the underside of a broken-off branch of a mango-tree, about 20 feet from the ground, and the eggs were deposited upon

a quantity of wood-dust that had fallen into the hole during the operation of boring, about 12 or 15 inches from the entrance. The old birds evinced great anxiety during the time I was enlarging the hole to procure the eggs, hopping from bough to bough within a few yards of me the whole time. On the 4th May, 1875, I saw another nest with half-fledged young ones; the hole was bored in the trunk of a dead tree about 30 feet from the ground."

Mr. J. Davidson writes from Western Khandesh:—"It is fairly common, breeding in April and laying generally three eggs, though I have found only two eggs nearly fully incubated."

The eggs are somewhat elongated, very regular ovals, dull white, and slightly glossy. They vary from 1.1 to 1.3 in length. and from 0.84 to 0.95 in breadth; but the average of a dozen eggs was 1.21 nearly by 0.88 nearly.

Cyanops zeylonica (Gm.). *The Ceylon Green Barbet.*

Megalaima zeylonica (Gm.), Hume, Rough Draft N. & E. no. 193 bis.

I know nothing of the nidification of the Ceylon Green Barbet, but Mr. Layard says:—"This Barbet breeds in hollow trees, laying three or four pure white, but very shining eggs; axis 1.1, diameter 0.95. The natives all affirm that the birds hollow out their own nest-hole; one I saw was in an unsound tree, the nest slightly formed of a few bents of dry grass."

I think this requires confirmation. Barbets do not, as a rule, lay (1st) *very shining*, (2nd) nearly spherical eggs, nor (3rd) do they make any nest; but it was Layard who described the Roller's eggs as greenish, profusely spotted with dark brown!

Colonel Legge remarks in his 'Birds of Ceylon':—"This bird breeds from March until July. The latter month is rather late, I imagine; but at that date I found a nest with four young ones near Minery. It hollows out with its powerful bill a hole in a rotten tree, just large enough to allow of its entering the egg-cavity, which is some distance down the trunk or branch. It does not use the same nest twice, but having found a tree with wood suited to its work, perforates it each year for the new nest, as many as eight or ten holes being sometimes visible in a tree by a jungle roadside. It is only when sounding wood before making its nest that these birds tap with their bills, the blows being very slowly repeated, with perhaps an interval of ten seconds between each. There are generally a few bents and grass-stalks collected for the eggs to lie on, but scarcely worthy of the name of nest. The eggs are three or four in number, pure white, glossy, and rather round in shape; they measure about 1.1 by 0.9 inch."

Cyanops lineata (Vieill.). *The Lineated Barbet.**Megalaima lineata (Vieill.), Jerd. B. Ind. i, p. 309.**Megalaima hodgsoni, Bonap., Hume, Rough Draft N. & E. no. 192.*

According to Mr. Hodgson's notes, this species (the Lineated Barbet) breeds in the valleys of the lower regions of Nepal. It begins to lay about April, and the young are ready to fly by June or July. It excavates a deep hole, some 16 inches in depth, in the trunk of some decayed tree, and lays three or four pure white eggs, which are figured as broad ovals, considerably pointed towards one end, and measuring 1.3 by 0.98 inch.

Mr. J. R. Cripps writes:—"7th May. 1875, Sylhet. Shot the male (skin of which accompanies) off the nest; contents four eggs, two of which I send you. The nest was about 15 feet off the ground, in a dead branch; depth of the hole 18 inches; just a few chips constituted the lining. The eggs were perfectly fresh."

Mr. Oates writes from Pegu:—"I have found numerous nest-holes of this bird, but never the eggs."

"On the 8th May I discovered two fully-fledged young birds in a hole of a horizontal branch of a tree about 10 feet from the ground. The entrance to the nest was on the upper side of the branch. The branches selected are, I think, always dead ones."

Major C. T. Bingham informs us that in Tenasserim "this Barbet was excessively common, but I succeeded in finding only two nests, one on the 25th March, and the other on the 13th April. This latter contained four young ones barely fledged. Out of the former, which was a mere hole leading to a shallow hollow in a dried bough of a teak-tree, which, having been cut down years ago, lay propped in a slanting position against a neighbour, I took three fresh eggs, which I found lying on the bare wood. The entrance-hole was irregular and evidently not a recently cut one."

Some eggs are rather elongated ovals, the shells fine, smooth, and rather fragile, but with scarcely any appreciable gloss. Other eggs are regular ovals, sometimes having a pyriform or even slightly cylindrical tendency; pure white and *fairly*, but not conspicuously glossy.

An egg of this species sent me from Sylhet by Mr. Cripps measures 1.25 by 0.95. Other eggs measure from 1.16 to 1.38 in length, by 0.83 to 0.91 in breadth.

Cyanops viridis (Bodd.). *The Small Green Barbet.**Megalaima viridis (Gm.), Jerd. B. Ind. i, p. 311; Hume, Rough Draft N. & E. no. 194.*

I have never taken the eggs of the Small Green Barbet; but Mr. Davison tells me that it "breeds very commonly on the Nilghiris in the trunk or larger branches of dry and partially decayed trees. Dr. Jerdon seems to question their excavating their own nests; but of this there can be no doubt, as I have repeatedly seen them at

work. The holes vary considerably both with regard to the depth of the entrance-tube, if it may be so called, and also with regard to the depth of the egg-chamber. The hole is shaped something like a retort with a very short neck. The eggs are pure white, rather glossy, and generally nearly as thick at the smaller as at the larger end, but in this, as well as in size, they vary very considerably. The normal number of eggs is, I should say, four, but very often only three are laid, while occasionally even five are found. Nothing is used to line the hole, the eggs being merely laid on a few chips of decayed wood. The bird appears rather to sit over than on her eggs, as she may be seen for hours together with her head sticking out of the hole. Breeds in March, April, and May, and sometimes continues laying even as late as the first or second week in June."

Mr. J. Darling, Jun., remarks:—"I can confirm what Mr. Davison says about this bird breeding commonly on the Nilghiris. From March 18th to June 4th, 1871, I took fifty-six eggs and twenty-six young birds. In one tree-stump about 20 feet high I took five nests. The number of eggs is either two or three, of a dull pure white with a little gloss. There is no shadow of a doubt about the bird making its own hole, as I have watched dozens of them. The nest is a circular hole, leading a little way in, and then down. I have also taken the nest in April in Calicut; and in Wynaad it breeds as commonly as on the Nilghiris. There is never a lining of any sort, except the soft wood."

Mr. Bourdillon, writing from Travancore, says:—"This bird breeds very commonly with us, laying its eggs about the middle of March, but it is excessively shy, and I have never been able to obtain the eggs. The nest is in a hole always in a dead tree, which the bird excavates, making a new one each year, so that it is not an uncommon thing to see six or seven holes in the same stump. I have had young birds brought me on May 3rd and May 27th, on both occasions almost fully fledged."

Colonel E. A. Butler has furnished me with the following interesting note from Belgaum:—"On the 10th February I found a nest containing three fresh eggs in the centre of the trunk of a low tree (green wood, but slightly decayed inside), only about 8 inches in diameter; and, replacing the wedge after taking the eggs, I returned again on the 25th inst., and found four more fresh eggs laid in the same hole. Unfortunately a gust of wind blew the tree down a few days afterwards, or probably the birds would have laid again."

"Another pair of birds bored a hole in the trunk of a huge climber (wood green, without any signs externally or internally of decay), and on the 28th March I cut into the nest and took three fresh eggs. On the 8th April I opened the hole again by taking out the wedge, and found three more eggs slightly incubated. On the 28th April I revisited the hole and found three more fresh eggs, the egg-chamber being a little deeper than when I visited it

on the 8th inst., and on the 6th May it contained another clutch of three fresh eggs.

"On the 7th March I cut into a nest-hole in an old dead tree, and took three slightly incubated eggs. The birds commenced a fresh hole a day or two afterwards in another branch about 6 feet below the other one, and on the 23rd March it contained three slightly incubated eggs.

"On the 7th March I also took a single fresh egg from a hole in a jack-tree; the tree was green, but where the hole was bored a branch had been broken off, and the wood was decayed for about a foot into the heart of the tree. On revisiting the tree on the 23rd March I found another nest-hole, containing three fresh eggs, bored about 6 feet below the first one in the trunk of the tree where another bough had been broken off, offering a situation exactly similar to that of the first nest.

"In addition to the nests above mentioned, I took nests on the following dates at Belgaum :—

"April 21st, 1879.	3 eggs, slightly incubated.
March 7th, 1880.	3 eggs, fresh.
" 7th, "	3 half-fledged young ones.
" 18th, "	2 fresh eggs.
" 20th, "	4 " "
" 22nd, "	2 slightly incubated eggs.
May 24th, "	3 fresh eggs.

"These birds are not at all shy when breeding; but as it is difficult to know when to cut into the nest, as it takes them a long time to excavate the egg-chamber, I have usually adopted the following plan, namely, to watch the birds from time to time whilst they are boring, when, as a rule, as you approach they come to the mouth of the hole and fly out. As soon, however, as the eggs are deposited, instead of flying out the hen bird usually peeps cautiously out of the hole, and remains motionless with her head projecting from the entrance, remaining there until you move away, when, if you have not frightened her, she will gradually withdraw her head and sink down into the hole again. In the heat of the day, and even at other times, they constantly sit with their heads peering out of the hole, but seldom leave it when there are eggs. Having satisfied myself that there are eggs by the action of the old bird, which I have described, I next proceed to cut a wedge out with a saw as neatly as possible on the upper side of the bough opposite the egg-chamber (or a little above it), which is usually about 9 inches from the entrance, and if there are eggs remove them, carefully replacing the wedge and gumming it firmly into its place again; the birds will probably then lay again in a few days in the same hole, and in some instances will go on laying clutch after clutch till quite the end of the season. As a rule, the holes are bored in dead branches on the underside, though in some instances they are bored in green wood. The eggs, three in number generally, and never more than four as far as my experience

goes, are invariably deposited either on the bare wood or upon the chips of wood and wood-dust collected in the hole during the time the birds are boring.

"The nest-holes vary in height from 6 to 50 or 60 feet, but as a rule they are usually about 10 or 15 feet from the ground, and the eggs are generally about 9 inches from the entrance, sometimes not more than 6 inches. They do not always make a fresh nest-hole, sometimes taking possession of a hole used the year before, and they usually occupy these holes to roost in the whole year round."

Mr. A. G. Cardew, C.S., tells us that "this bird, which is very common on the Nilgiris, breeds in March and April. It excavates a hole some inches deep in a dead but not decayed tree; indeed, so far as I have seen, the hole is always made in very hard wood, any rotten part being avoided. The entrance is a clean-cut circular hole. There is no nest, and the three white glossless eggs are laid on the bare wood. They are usually a good deal elongated in shape, and measure from 1.22 to 1.30 by about 0.8.

"This bird is easily kept in captivity, feeding greedily on plain-tains. They are dangerous if in the same cage with other birds, as their powerful bills can easily break the skull even of a Dove. They are wild and uninteresting and difficult to tame. When the loud crowing call, so familiar to persons acquainted with the Nilgiris, is made, the throat is distended so that the skin over that part appears bare of feathers."

Captain Horace Terry, referring to the Pulney Hills, says:—"Fairly common at Pittur; found a new nest at the beginning of May, but no eggs."

The eggs of this species, sent me from the Nilghiris by Miss Cockburn and Mr. Davison, are dull pure white, only moderately glossy, more or less broad ovals.

None of the eggs I have seen are of the very elongated shape which so often characterizes the eggs of *Xantholæma hæmacephala*.

They vary in length from 1.07 to 1.22 inch, and in breadth from 0.75 to 0.96 inch; but they average 1.13 by 0.86 inch.

Mesobucco cyanotis (Blyth). *The Blue-eared Barbet.*

Megalæma cyanotis (Blyth), *Hume, Cat. no. 198 ter.*

Major C. T. Bingham writes from Tenasserim:—"This pretty little species I have found very common in the Thoungyeen valley; nor was it rare on the Attaran. I give below a note of finding the eggs and nest, recorded long ago:—

"*Bank Thabybee choung, Wimjeo River, 12th February, 1878.* Crossing a 'plioonzah,' or deserted 'toangyah' (*anglice*, cultivation clearing), this morning, I heard and saw a small Barbet, which by its call I recognized as *Megalæma cyanotis*, shouting vigorously from the top of a tall dead pinkado tree. As I approached, for

the purpose of getting a shot, the bird flitted down to a thick lower branch, and disappeared on the underside. On getting under the tree I discovered a tiny hole, and immediately sent a peon up to ascertain if there were any eggs. As he got on to the next branch below the one in which the hole was, the little bird darted out, and though I fired hastily I missed; however, I had identified it, so I didn't much care. After cutting and hacking for a short time at the branch, which was decayed more or less, the man managed to get his hand in, and shouted down that there were two eggs resting on the bare wood.

"These I directed him to extract carefully, tie up in his goungeboung (head handkerchief), and let down carefully with a string he had taken up. No sooner said than done. He then cut off the decayed branch. The nest-hole ran about 6 inches into the branch downwards, and the entrance looked as if it had been about an inch in diameter. The two eggs were pure pearly white, with a pinkish tinge from the yoke showing through, not very glossy, and rather elongated in shape. They measure respectively 1 and 0.97 by 0.7 and 0.69."

Mr. J. Darling, Junior, also found the nest of this species in Tenasserim. He says:—

"15th April. Found a nest of *Megalæma cyanotis*, some twenty miles east from Tavoy. It was excavated in a small rotten stump 20 feet from the ground; the entrance-hole was 1 inch in diameter, going into the stump 3 inches, then going downwards $6\frac{1}{2}$, and terminating in a chamber 2 inches in diameter. The nest contained no lining of any sort, the three fresh eggs it had in it being laid on the plain wood."

These three eggs measured 0.92, 0.9, and 0.85 in length by 0.68, 0.65, and 0.65 respectively in breadth.

The eggs vary a good deal in size, but all are much elongated ovals. Like the eggs of all the Barbets, the shells are excessively fine and thin, glossless and pure white.

Xantholæma hæmacephala* (P. L. S. Müll.). *The Crimson-breasted Barbet.

Xantholæma indica (Lath.), *Jerd. B. Ind.* i, p. 315.

Xantholæma hæmacephala (Müll.), *Hume, Rough Draft N. & E.* no. 197.

I have always found the nest of the Coppersmith, or, as Jerdon pleases to call it, the Crimson-breasted Barbet, in March, April, or May; but in Central and Southern India it begins, I believe, to lay earlier.

Sometimes it fixes upon a branch, hollow from end to end, and with a wide natural aperture, but in these cases it generally cuts a new entrance, nearer to the bottom of the cavity, some 2 inches in diameter, and always, I think, on the underside of the bough. As a rule, however, like others of the family, these Barbets seem to

be able to find out branches that are decayed internally, although externally to the human eye exhibiting no signs of this, and into such, through the harder external shell of the branch, they cut a perfectly circular hole with the edges neatly bevelled off inside and out. The eggs are at the bottom of the cavity into which they have thus bored (and which they smoothen a good deal interiorly), often a couple of feet below the *door*, and laid merely on the chips produced in the course of the work.

The normal number of the eggs is four, but I have not unfrequently found only three hard-set ones or newly-fledged young birds.

The hole varies in length from 1 to 4 or 5 feet, and the diameter of the chamber, when, as sometimes happens, this is cut entirely by themselves in sound though soft wood, scarcely exceeds 4 inches. The birds often use the same hole year after year, but generally lengthen it each season. Colonel G. F. L. Marshall, writing from Saharunpoor, says that "these birds breed in the beginning of March, and lay generally three clear white cylindrical eggs in a hole in a tree, which it usually cuts out for itself in a *pukain*-tree or some other soft wood. I saw one nest in a sound branch of a peach-tree; the girth of the branch was only 13 inches, and the whole heart of it was cut out to a depth of 16 inches; at the bottom of the hole were the eggs. The parent bird would not come out, even though I shook the branch violently, and it picked viciously at anything put to the mouth of the hole, remaining just inside the entrance."

The late Captain Beavan tells us that this species "breeds in Maunbhoom at the beginning of April. The eggs are generally three in number, white, and much elongated. Length 1 inch, greatest breadth 0.62 inch.

"A bough was brought to me which it had excavated and formed into a nest; length of the hole from aperture to bottom was 7 inches, and its diameter about 3. There was no nest at the bottom, the eggs being laid on the wood, which was hollowed out in an oval shape. It seems always to select the *underside* of a bough to commence operation on."

Mr. F. B. Blewitt remarks (writing from the Central Provinces):—"With this species the period of nidification is from about the middle of January to end of March or early part of April. The most suitable hollow in any description of tree is selected for the nest-hole. If it has a preference at all, it is certainly for the neem-tree, in the decayed and hollow branches of which I have discovered the greater number of nests. In several instances I noticed that the parent birds, for more secure and ready ingress and egress to the nest, had picked small circular holes through the bark and wood of the branch, selecting always its underpart for the new entrances. The eggs are invariably deposited on the bare wood, and as on one occasion I found in a nest, in the hollow branch of a large peepul-tree, four very young birds, I believe four to be the maximum number of the eggs. I was once

witness, during the breeding-season, of a singular contest between two male Barbets for the possession of an old nest in the decayed branch of a neem-tree, which each claimed. A short struggle took place at the entry-hole, when they deliberately flew to and sat on a near branch, faced about, and desperately pecked each other for near two minutes, when they closed and fell to the ground. Twice again did they return to the branch and renew the contest, with the same result. In the fourth attempt, however, to reach the branch, the weaker bird, from exhaustion, failed to do so; it then flew and perched on a low bamboo framework. The other immediately followed, and in the renewed contest seized his antagonist firmly by the beak, shook him off the bamboo, and kept him suspended (by the beak) for near a minute, when both fell to the ground. The weaker bird, exhausted as he was by the prolonged fight, recovered himself slowly and flew away, while the victor returned to the nest. I have taken the eggs both in the Sumbulpore and Raepore Districts."

Writing from Sambhur Mr. R. M. Adam remarks:—"The Crimson-breasted Barbet is very common about all the gardens here. It breeds about April and May. The young birds have the yellow on the throat and about the eyes very pale; there is no red on the breast, and the whole of the head and neck is a dull green.

"I once found a nest of this bird in a mango-tree in North Behar on the 21st of March."

Dr. Jerdon says:—"A pair bred in my garden at Saugor, in the cross-beam of a vinery. The entrance was from the underside of the beam, perfectly circular. It appeared to have been used for several years, and the bird had gone on lengthening the cavity inside year by year till the distance from the original entrance was 4 or 5 feet; and it had then made another entrance, also from below, about 2½ feet from the nest. I quite recently observed a nest of this bird in a hole of a decayed branch of a tree, close to a house in a large thoroughfare in Calcutta."

Writing of Rajpootana in general, Lieut. H. E. Barnes remarks:—"The Coppersmith begins to breed in February, and eggs may be found quite up to the middle of April, but most of them are laid in the commencement of March."

Colonel Butler, writing from Deesa, says:—"The Crimson-breasted Barbet breeds in the neighbourhood of Deesa in January, February, and March. I cut into a nest on the 27th February, 1876, and found three slightly incubated eggs. I found another nest near the same place a few days later (29th), which contained three young unfledged birds about a week old. There were three holes in the branch of an old dead tree, one above the other, and about 1 foot apart. The lower one contained the chicks referred to, the middle one was used by another pair of birds, which doubtless would have laid in a day or two if I had not disturbed them, the upper one was not used."

And from Belgaum he records :—"Nests taken at Belgaum from the 11th February to the 25th March.

"In the case of a nest taken on the 7th March I cut a wedge out of the bough opposite the egg-chamber about a week before, and finding no eggs gummed the wedge in again, but the birds did not forsake the nest. Soon after taking the eggs from this nest, the birds commenced boring a fresh hole on the same old branch, about a foot below where it had been sawn across to take the first egg, and on cutting into it on the 10th April I found two more eggs.

"I have seen nests as low down as 7 feet from the ground, and as high as 30 or 40 feet."

Major C. T. Bingham remarks :—"Breeds at Allahabad from February to the end of April, and I think also in July ; at Delhi in March and April."

Colonel A. C. McMaster relates that "a pair bred in my garden at Bellary in the cross-beam of a vinery, and at Bombay I found a nest in the dead branch of a tree close to the house. The entrance was so small that it was difficult to believe that the bird could get through it ; it was perfectly circular, and as well bored as if it had been cut with an auger ; the hole was not more than 18 inches in depth, but the little carpenter was busily employed in enlarging it by cutting out very small chips and throwing them about the spot ; as far as could be judged from probing, the inside appeared beautifully smooth."

In Ceylon this species breeds from January to June.

Mr. Oates writes from Pegu :—"This year I took several clutches of eggs from the 6th March to the 5th April."

The long, narrow, pure white egg of this species, whose fragile shell has rarely much, and is often devoid of *all* gloss, reminds one much of those of our Common Indian Swift (*C. affinis*). Typically the eggs are almost cylindrical, tapering somewhat towards one end, but the ends themselves are broad and obtuse, and no tendency to point is observable ; they vary, however, much in size, and within certain limits in shape also. Here and there a tolerably perfect oval may be met with, and a slightly pyriform variety is occasionally obtained. When fresh and unblown, like so many eggs of this type, they have a delicate pink blush.

In length they vary from 0·87 to 1·07 inch, and in breadth from 0·62 to 0·72 inch ; but the average of a very large series is 0·99 by 0·69 inch.

Xantholasma malabarica* (Blyth). *The Crimson-throated Barbet.

Xantholasma malabarica (Blyth), *Jerd. B. Ind.* i, p. 317 ; *Hume, Cat.* no. 198.

Mr. F. W. Bourdillon, writing from Travancore, says :—"This species is very common throughout the low country, and during

the hot weather ascends the lower slopes of the hills. Its call, as Jerdon mentions, is similar to that of the Crimson-breasted Barbet (*X. hæmacephala*), but the two are easy to be distinguished from each other. My brother obtained two fresh eggs of this species early in March at an elevation of about 500 feet above sea-level. The eggs were white, smooth, and glossless, measuring 0.94 by 0.62, and 1 by 0.66. They were placed without any attempt at a nest, in a hole cut by the birds, in a dead branch about 20 feet from the ground."

An egg of this species, taken by Mr. Bourdillon in South Travancore, on the 6th of March, is a very elongated oval; the shell extremely fine and smooth, but almost entirely devoid of gloss. It was, of course, white and spotless, and measured 0.98 in length by 0.65 in breadth.

***Xantholæma rubricapilla* (Gm.).** *The Small Ceylon Barbet.*

Xantholæma rubricapilla (Gm.), *Hume, Cat.* no. 108 bis.

Colonel Legge writes, in the 'Birds of Ceylon':—"The breeding-season of this little bird lasts from March until June, and it usually nests in the decayed branches of living trees, the bread-fruit (which is generally much encumbered with small dead top branches) being a favourite resort with it. It plies itself to the task of excavating the hole with great assiduity, first of all slowly tapping the wood all over until it has found what it imagines is a soft place; very often, after working in for an inch or so, it will find that the wood is too hard for its capabilities, and will then try another spot in the same branch. A nest I once found was in the topmost branch of a bread-fruit; the habitation was an old one, but close to it were one or two essays at making a fresh hole; the wood had evidently proved too hard, and it had returned, perhaps reluctantly, to the old nest. The branch was about 4 or 5 inches in diameter, and the hole entering the cavity 2 inches and perfectly round; the nest was about 6 inches below the aperture, and the young, which were three in number, reposed upon the bare wood without any nest-lining whatever. The eggs are glossy white, rather spherical in shape, and measure about 0.9 by 0.65 inch."

Order UPUPÆ.

Family UPUPIDÆ.

Upupa ceylonensis, Reich. *The Indian Hoopoe*.

Upupa nigripennis, Gould, *Jerd. B. Ind.* i, p. 392; *Hume, Rough Draft N. & E.* no. 255.

The Indian Hoopoe lays from February to May in different parts of India. In the Doab March and April are the months in which the majority of the eggs are found.

They nest in holes in trees, walls, or banks, never at any great elevation from the ground, and occasionally in the roofs and between the rafters of houses. Very little nest is made as a rule; a little hair, a few feathers, leaves, or fine grass-stems, carelessly strewed over the floor of the hole or hollow, constitute their apology for a nest, and when the holes of trees are resorted to, there is often absolutely no nest at all. The female alone incubates, and, especially when the eggs are near hatching, scarcely ever leaves them for a moment, being assiduously tended by the male, who brings her food perpetually.

From four to seven is the normal number of the eggs, but smaller numbers may often be met with fully incubated, while eight and nine are *said* (I do not vouch for the fact) to be occasionally met with.

Miss Cockburn, writing from Kotagherry, tells us that "the Lesser Hoopoe selects holes in stone walls (such as are built for cattle-pens) and in earthen banks as places to build in, and forms a mere apology for a nest, consisting of a few hairs and leaves, which in a short time has a most offensive smell, and it is many days before the eggs, which are four in number and of a dingy white colour, lose what they have imbibed from it. They are generally found in April. These birds select, if possible, the same places every year to lay in."

Mr. Davison gives me the following note:—"This species breeds on the Nilghiris in April and May, laying usually seven eggs in the hollow of a tree, or in holes in old walls, and I have even known of a nest taken from under a large stone lying on the side of a much-frequented road. I have noticed that the only pretence of a nest was a few dried leaves and small twigs. I am not certain whether these were brought into the hole by the bird, or, as is most probably the case, were accidentally accumulated there. It is curious how very closely the female sits, especially when the eggs are much incubated. I have frequently put my hand into

the hole and taken her off the eggs, she pecking quite viciously all the time, and occasionally giving utterance to a peculiar hissing sound. The same hole is used year after year, even although all the eggs are taken each time. I took eggs from the same hole for four consecutive years. After the eggs were taken, the bird did not lay again in the same hole that year, although she returned to it again the next."

In the Deccan, we learn from Captain Burgess that "it breeds in the middle of April and May, building its nest in holes in the mud walls which surround the towns and villages in the Deccan. I transcribe a note, taken on 7th May, 1850, on the subject:— 'To-day a man brought me word that about fifteen or twenty days ago he found a pair of Hoopoes breeding in a hole in the wall of a town; the nest contained two young birds; it was composed of grass, hemp, and feathers. The same man tells me that he discovered another pair building.' The headman of the town of Sintee brought me an egg of the Hoopoe; it was of a very pale-blue or rather skim-milk colour. He found the nest in a hole in a fort wall; it was made soft with a few pieces of hemp, and contained three eggs."

Colonel G. F. L. Marshall remarks:—"The Hoopoe breeds in March in the Saharunpoor District; the young are hatched towards the end of the month.

"The eggs are laid in holes of trees, or among the rafters of houses, and often in the nooks and crannies formed by twisted suckers of the banian-tree (*Ficus indica*); if in the roof of a house, the eggs are generally laid on a little layer of rubbish and thatching grass, but in trees no attempt at lining the hole is made.

"The usual number of eggs is five or six. They are of an opaque greenish-blue colour, without spots; in shape they are an elongated oval; the shell is thick and rather rough.

"It is a very familiar bird and common in the district, almost every house having a pair living in the verandah."

In Oudh Mr. E. M. Adam says that our bird "breeds during February, March, and April; they build in holes in buildings and in the trunks of trees. The eggs, in one case, were laid in a hollow surface which was carelessly lined with human hair. The first nest I saw was on the 26th March. It was built in a hole in the wall of the Baraich Court-house, about 15 feet from the ground, and contained several well-fledged young birds. Although crowds of natives were constantly thronging in the immediate vicinity of the nest, the birds kept flying backwards and forwards feeding their young.

"Another nest was built in a hole in the mud gable-end of an inhabited house, about 5 feet from the ground. The bird was sitting on six eggs, and when I put my hand into the opening it merely receded, showing no inclination to defend its eggs or to make a noise.

"The third nest I found was in the trunk of a nasoot or nasuk tree (*Erythrina indica*), about 5½ feet from the ground.

"On two occasions I found six eggs in one nest, and once I found two fresh eggs."

From Kumaon and Gurhwal, Mr. R. Thompson tells us that "*Upupa nigripennis* breeds, beginning early in February, till end of May. In the Sub-Himalayan region these birds, breeding in forest or jungly tracts, select hollows of trees at no great elevation from the ground. The eggs, four or five in number, of a very pale blue, are laid on the bare wood without any preparation or pretence to a nest being made. The young are hatched sparingly covered with a beautiful white down, and emit a very offensive smell. The female sits closely and hisses like a snake if approached. I have known instances when, if a young brood was destroyed, or the eggs removed, the parent birds set about and selected a new site for a nest, and therein recommenced the nidification process.

"The Common Hoopoe extends far into the Himalayas, but keeps along the lowest levels of the warmer valleys. I have known them to breed and live all the year round at Sireenuggur in Gurhwal."

The late Colonel McMaster wrote:—"At Madras I found (February 24) a Hoopoe's nest in a hole in a tree close to the club: there were two fully-fledged young birds in the nest, about which there was not the faintest trace of evil stench (*vide* p. 391 of Jerdon)."

Major C. T. Bingham writes:—"Both at Allahabad and Delhi this bird is an early breeder. I have found hard-set eggs by the first week in April. It nests in holes in trees and walls, by preference I think the former. When the eggs are hard-set, the birds sit very close. I caught one off a nest in a hole in a neem-tree on the banks of the Western Jumna Canal on the 25th March; the eggs, three in number, were laid on decayed scrapings of wood."

Colonel Butler remarks:—"Belgaum, 31st March, 1880. A nest in the hole of a tree about seven feet from the ground, containing fully-fledged young ones, I could not see how many."

Messrs. Davidson and Wenden note from the Deccan:—"Very common and breeds."

Mr. A. G. Cardew sends me the following note:—"A pair of these birds has bred for several successive years in a drain in the Government Offices at Ootacamund, the mouth of which is closed by a grating only just giving room for the birds to enter. The nest was placed at least four feet from the mouth of the drain. The young birds are fledged towards the end of April."

Colonel Legge writes in the 'Birds of Ceylon':—"The breeding-season in the north of Ceylon lasts from November to April, and possibly a second brood may be reared later on in the year, as Layard mentions the shooting of young birds in August."

The eggs of our Indian Hoopoes are commonly a very lengthened oval, almost always a good deal pointed towards one end, and sometimes showing a tendency to be pointed at the other end too, a most remarkable form of egg, which I cannot recall having observed in any other species. In colour they vary somewhat,

chiefly, I think, according to whether they are fresh or more or less incubated when obtained. When quite fresh, all those that I have seen were of a pale greyish-blue tint, what Dr. Jerdon, I think, calls skimmed-milk colour, but many are of a pale olive-brown or dingy olive-green, and every intermediate shade of colour is observable. As a rule, they have scarcely any gloss at all, and of course are quite devoid of markings. They are decidedly smaller, and, as a rule, more elongated than the eggs of *U. epops*.

In length they vary from 0.9 to 1.05 inch, and in breadth from 0.65 to 0.73 inch; but the average of fifty eggs measured is 0.97 by 0.66 inch.

Upupa epops, Linn. *The European Hoopoe.*

Upupa epops Linn., *Jerd. B. Ind.* i, p. 300; *Hume, Rough Draft N. & E.* no. 254.

So far as I know the European Hoopoe, though a common visitor to the plains of India during the cold season, breeds with us only in the Western Himalayas.

They lay during April and May, and possibly in June also, in hollows of trees, as a rule, but occasionally in holes in the walls of ruined temples. They appear generally to make some little nest, a little grass and a few feathers being placed as a bed for the eggs; but in a nest that I found in a little ruin in the valley of the Beas, above Minalee, a quantity of soft hair had been added to the usual complement of grass and feathers.

They lay normally from four to seven eggs, but Mr. Brooks informed me that he took a nest out of a hollow willow at Ramu in Kashmir on the 16th of May, containing ten deeply-incubated eggs.

From Murree, Colonel C. H. T. Marshall reports:—"Two nests in holes in trees. In one instance we watched the cock bringing food to the hen, whom we afterwards caught on the nest. This would go to prove the theory advanced that the Hoopoe, like the Hornbill, remains on her nest all the time until the eggs are hatched. Elevation 7000 feet."

Dr. Jerdon remarked in the 'Ibis':—"This Hoopoe breeds very generally in the N.W. Provinces in the verandahs of houses, and I watched one for some days in the house of the late Dr. Scott at Umballa."

Lieut. H. E. Barnes, writing from Chaman in Afghanistan, says:—"The European Hoopoe arrives during March, and commences to breed soon after. I have been very unfortunate in procuring eggs, although I have many times found young birds. All the nests I have examined have been in holes in trees, slightly cleared out by the birds, and all having an offensive smell.

"The only egg I have was obtained in a peculiar manner, but in such a way as to leave no doubt of its identity. An Afghan found a nest containing three eggs, which he accidentally broke; he caught the parent bird which, strange to say, laid another egg

in his hand. I confined the bird in a cage, hoping she would lay again, but during the night she escaped. The egg is a very pale skim-milk blue, nearly white, rough and chalky in texture, and oval in shape."

Major Wardlaw Ramsay says, also writing of Afghanistan:—"It was breeding in June."

The eggs are similar to those of our common Indian Hoopoe, but considerably larger; they are somewhat elongated ovals, devoid of gloss, varying in tint from pale bluish to pale greenish grey. They exhibit no markings, but are often a good deal stained in the process of incubation.

They vary in length from 1·06 to 1·2 inch, and in breadth from 0·63 to 0·75 inch; but the average of numerous eggs is 1·14 by 0·7 inch.

Upupa longirostris, Jerd. *The Burmese Hoopoe*.

Upupa longirostris, Jerd., *Hume*, *Cat.* no. 254 bis.

Mr. Oates writes from Pegu:—"I succeeded in finding nests with eggs this year. One nest, found on the 10th March, contained two eggs, quite fresh, and another, found on the 7th April, three eggs, two of which were slightly incubated and the other addled. The nests in both instances were in natural hollows of large trees, and the eggs were placed on the bare wood. In colour they are pale spotless blue, and they measure on an average 0·91 by 0·67; two are quite without gloss, but three others are glossy to a very small extent.

"April 14th.—Young ones in a hole of a large forest-tree about 15 feet from the ground."

Mr. J. Darling, Junr., found the nest in the Malay Peninsula. He says:—"I took a nest at Salang on the 24th February out of a hole of a large tree in the village. The hole was a natural one, 5 feet from the ground, the entrance 3 inches in diameter, and the eggs 2 feet inside. There was no nest of any kind, the four fresh eggs being on the wood. I took the bird off the nest with my hand. I found two more nests in the same kind of situation, containing, one four, and the other five, fully-fledged young.

"26th February.—I took five hard-set eggs of this bird to-day, which broke in blowing. The nest was of the same kind and in a similar place as that of 24th. These nests are very common here and in queer situations, sometimes in a large fork, sometimes on a thick bough, and frequently in a clump of thick ferns or orchids."

The eggs are barely to be distinguished from those of our other Hoopoes; they are elongated ovals, often somewhat pyriform, the shell very fine and compact, and with a faint gloss. In colour they are a uniform very pale and very delicate slightly greenish blue.

Five eggs from Salang measure from 0·98 to 1·0 in length by 0·7 in breadth.

Order TROGONES.

Family TROGONIDÆ.

Harpactes erythrocephalus (Gould). *The Red-headed Trogon.*

Harpactes hodgsoni, Gould, *Jerd. B. Ind.* i, p. 202; *Hume, Rough Draft N. & E.* no. 116.

Dr. Jerdon has the following remarks on the nidification of the Red-headed Trogon:—"I had the eggs of this Trogon brought to me at Darjeeling. They were said to have been taken from a hole in a tree; they were two in number, white, and somewhat round. There was no nest, it was stated, only some soft scraping of decayed wood."

Mr. Hodgson notes that "this species begins to lay in April, the young being ready to fly in June or July; they scoop a hole out in a decayed tree, digging down about 7 or 8 inches. The eggs, three or four in number, are pure white, moderately broad ovals, slightly pointed towards one end, and measure about 1.25 by 0.87 inch. They breed only once a year; both male and female assist in rearing the young; as a rule, this species only breeds in the lowest forest-clad hills, and the forests of the Terai."

Mr. Gammie writes:—"On the 19th May I found a breeding-hole of this Trogon in the Byeng valley (Sikhim), at about 2000 feet. It had been excavated by the bird itself in a dead and much decayed tree-stump of only 4 feet in height and 9 inches diameter. The hole was 7 inches deep by 3.5 inches wide. The entrance was also 3.5 inches in diameter, and was within a foot of the top of the stump. A few chips lay at the bottom of the hole, but there was no other nesting-material. The stump was in a thin mixed jungle of bamboos and small trees, a much more open situation than I would have expected so shade-loving a bird to choose, but probably it concerned itself more about the softness of the nesting tree than its situation. In this case the stump was as soft a one as could have been found in the whole valley.

"The eggs were four in number and fresh. Four is, I believe, the full complement."

The eggs sent by Mr. Gammie were very *Merops*-like in appearance. Very broad, nearly spherical ovals, white and glossy, but the white is not quite so pure as in *Merops*, and on the contrary has a pale-creamy or ivory tinge, very apparent when the eggs are laid, beside really pure white ones. They measured 1.1 by 0.94.

Other eggs of this species have been since sent me from Sikkim, where they were taken in July by Mr. Mandelli. They were taken from a hole scooped on the top of a truncated tree; a bare hole devoid of lining. This was in one of the low valleys below Darjeeling.

These eggs are also broad ovals, white, but with a decided creamy tinge, the shell very fine, and with a considerable amount of gloss. Three eggs were found, two of them measure 1·07 and 1·13, both by 0·93.

Thus, while *H. hodgsoni* lays four nearly pure white eggs, *H. oreskios* would seem to lay only two or three, and these of a very decided though pale *café-au-lait* colour. The eggs of the latter are, as might have been expected, smaller, but both species lay normally very broad, oval glossy eggs.

Mr. Oates records the following note from Pegu:—"On the 8th May a female of this species flew from the top of a dead trunk of a tree, about 20 feet high, as I was passing through the forest at the Entagau Bungalow, twelve miles from Pegu. A man, on being sent up, reported that there were three eggs resting on the bare wood in a cavity at the top of the stump. In about a quarter of an hour the bird returned and began sitting. I started her off and shot her. The eggs were then brought down to me.

"In shape the eggs are nearly spherical, and in texture the shell is smooth to the touch and tolerably glossy. The colour of all is a pale buff or *café-au-lait*. They are in fact of precisely the same colour as the eggs of *H. oreskios*, with which Major Bingham has lately kindly favoured me. In size and shape they, however, differ very conspicuously, the dimensions of the three eggs of *H. hodgsoni* being respectively 1·1 by 0·98, 1·08 by 1, and 1·1 by 1·01."

Major C. T. Bingham says, writing from Tenasserim:—"On the 11th March I found a nest of this bird containing two eggs, almost pure white, blunt oval in shape, and one of which measured 1·08 by 0·9. The nest was in the head of a stump leaning over the Queebawchoung (a feeder of the Meplay) at its sources, and consisted merely of a little hollow dug out of the rotten wood at the top at a height of about 8 feet from the ground. A Karen who was with me managed to catch the female alive with his hand as she sat on her nest, but unfortunately broke one of the eggs."

An egg of this species taken by Major Bingham is precisely like those taken by Mr. Gammie, broad oval, very glossy, and nearly pure white.

Harpactes fasciatus (Forst.). *The Malabar Trogon.*

Harpactes fasciatus (Gm.), *Jerd. B. Ind.* i, p. 201; *Hume, Cat.* no. 115.

Writing on the 15th April from South Travancore, Mr. F. Fulton Bourdillon says:—"I was so fortunate as to obtain a nest

and egg of the Malabar Trogon (*Harpactes fasciatus*) the other day, and as you may care for an account of them, I send them to you.

"The nest is a very simple affair, being only a little rotten wood in a hollow at the top of a dead stump, and about 8 feet from the ground. It did not seem to have been excavated at all, nor was there any entrance bored, as would have been the case with a Barbet's nest.

"The eggs are, of course, pure white, very round, glossy, and rather large for the size of the bird. They were two in number, and as they were slightly incubated, I presume that is the full number laid. They measure 1.07 by 0.82 and 1 by 0.92.

"Taken March 22nd, 1878. The nest was in thick jungle."

Major C. T. Bingham says:—"About the middle of May 1870, while out shooting in the jungles about the Ram Ghat, thirty miles from Belgaum, on the old road from that station to Vingorla, I chanced upon the nest of *Harpactes fasciatus*. It was in a hole in an old decayed tree standing in the middle of thick jungle near the village of Moolus, at the foot of the aforesaid ghat. My attention was attracted by seeing a bird fly out, which on shooting I found to be the female of *Harpactes fasciatus*. The entrance to the nest was a circular hole, which I had to enlarge to get at the eggs; these were two in number and pure white. As well as I can remember, they were perfectly fresh and laid on the bare wood. I secured the male a few minutes after close by."

Mr. Iver Macpherson writes from the Kaken Cotté State Forest, Mysore District:—"Bird and three eggs sent.

"26th April, 1880. While looking up at a very rotten tree, the top of which had been blown off, a bird with a red breast flew out of an old hole some 20 feet from the ground.

"My Coorvobah went up and reported three eggs. Returned again in an hour, and shot the bird as it flew out of the hole. It turned out to be a male of the Malabar Trogon. I did not observe the female bird anywhere about. The eggs were slightly incubated.

"This bird is by no means common in these forests."

These three eggs measure 1.1, 1.09, and 1.06 in length by 0.95 in breadth.

The eggs of this species are, like those of *Harpactes erythrocephalus*, very broad ovals, and much about the same size as those of that species. Seen alone they would perhaps be pronounced pure white, but laid alongside eggs like those of the *Meropida* they are seen to have an excessively faint ivory tinge; it is barely perceptible, but still it is perceptible. The eggs of this species that I have seen have had a very fine gloss indeed, not inferior to those of the *Meropida*.

Harpactes oreskios (Temm.). *The Yellow-breasted Trogon.*

Harpactes oreskios (Temm.), *Hume, Cat. no. 110 bis.*

Mr. W. Davison writes from Tenasserim:—"On the 11th of February I took my first nest of *Harpactes oreskios*, containing two fresh eggs. The eggs were laid on a few chips of decayed wood at the bottom of a hole scooped out (evidently by the bird) at the top of a decayed stump about 4 feet high, and was placed on the very edge of the path. The following day I took two more nests, each containing three eggs slightly incubated. One was in an exactly similar situation to the first nest; but the other was in a bit of dead wood about 9 inches long that was stuck in a creeper, and was about 12 feet above the ground.

"There is no doubt that the nest-holes are hollowed out, or at any rate enlarged, by the birds themselves. Besides the three nests I obtained with eggs, I found several more without eggs, and in one instance actually saw the hen Trogon at work excavating the hole. A very rotten stump is chosen, so that the bird can without difficulty chip out the wood.

"The eggs I took vary much in shape and size; two from one nest and three from another are very short and broad, while three from another are very long and narrow. They are all of the same colour, a delicate pale *café-au-lait*, almost the same colour as the eggs of *Chalcophaps indica*, and vary from 0.99 to 1.18 in length by 0.8 to 0.86 in breadth.

"I think that the full number of eggs laid by this species is three. A nest that I found, however, containing young, had only two of these."

Major C. T. Bingham writes:—"On the 21st February, 1877, as I was on the march from the village of Toungeedee to the village of Tagoondine, on the southern bank of the Winges River in the Tenasserim Provinces, I was so fortunate as to find a nest of this handsome Trogon.

"My order of march was, generally, first my guide, next myself, then my interpreter, lastly my peons in single file, as the paths through the dense forests here are narrow. On this occasion, however, I had loitered behind to shoot a jungle-fowl that had been crowing lustily some distance off the road, and my men were waiting for me. As I came up I noticed something like the tail of a bird sticking apparently out of a dead branch in a zimbom tree (*Dillenia pentagyna*) right over the head of one of the peons. Examining it closer, I saw it was a long-tailed bird of some kind seated in a most uncomfortable position seemingly in, or rather on, a hollow in the branch, its head drawn in and its tail sticking over its back. As soon as it observed me watching, it flew off, and then with a great jump of my heart into my mouth I saw it was a female *Harpactes oreskios*. I was up the tree in a second, telling one of my men to watch the bird; the branch was not 12 feet

above the ground, and I almost tumbled off in my delight on finding a cup-shaped hollow on the upperside, some 3 inches deep by $3\frac{1}{2}$ in diameter, containing two roundish creamy-white eggs, quite fresh, laid on the bare wood.

"I looked round now for the bird, and saw her, joined by her mate, seated on a bamboo not ten yards off. Slipping down the tree quietly I took my gun and fired, hoping to bring both down as they were seated close together, but succeeded only in securing the male.

"It rather surprised me to find a nest, or even to see Trogons in such open dry forest as I was going through; and the nest, too, in a tree on the very border of the highroad (though it is a mere pathway after all) from Maulmain to the Shan country.

"I cannot say whether the hollow in the dead branch was made by the Trogons themselves or not; the wood was rotten enough to be easily pecked out by the bird, but I rather suspect the cavity must have been hollowed out first by a Woodpecker, and that then a portion was afterwards broken off or more probably fell off."

Subsequently he added the following note:—"This handsome Trogon was very common in the Sinzaway Forest. I found on the 11th March two nests—one containing two young just hatched, and the other one broken egg and one addled one. On the 14th March I found a third nest, and on the 15th three more, all containing young ones. Again, on the 19th I found a nest with two fresh eggs. In all cases the nests were mere hollows scraped or worn away in decayed branches or stumps of trees. The one addled egg differs in being a longer oval than others I have found."

A very large series of these eggs sent me by Major Bingham and obtained by my collectors show that this egg varies very little in colour, and is always a very uniform delicate *café-au-lait*. The shell has always a fine gloss, but in shape and size the eggs vary a great deal, from a moderately long oval to a very broad and round one, often exhibiting a pyriform tendency, and though almost invariably very obtuse at both ends occasionally slightly pointed towards the small end.

Numerous eggs measure from 0.92 to 1.18 in length by 0.79 to 0.87 in breadth.

Order COLUMBÆ.

Family COLUMBIDÆ.

Subfamily COLUMBINÆ.

Columba intermedia, Strickl. *The Indian Blue Rock-Pigeon*.

Columba intermedia, Strickl., *Jerd. B. Ind.* ii, p. 409; *Hume, Rough Draft N. & E.* no. 788.

Our Indian Blue Rock-Pigeons breed freely, as far as I have been able to ascertain, throughout India proper, alike in hills and plains, though many of the Himalayan and Suliman Range birds are intermediate between *C. intermedia* and *C. livia*, and a few may be considered typical specimens of the latter. Into Assam, Cachar, and Burma I am not aware that it extends, but these localities have been as yet too little worked to enable me to speak with certainty to the fact.

The breeding-season in Upper India lasts from Christmas to May-day. The nest is chiefly composed of thin sticks and twigs, but are often more or less lined with leaves of the tamarisk, feathers, &c. As to-situation I can quite endorse Dr. Jerdon's account. He says:—"They are most partial to large buildings, such as churches, pagodas, mosques, tombs, and the like, frequently entering verandahs of inhabited houses and building in the cornices. Holes in walls of cities or towns, too, are favourite places, and in some parts of the country they prefer holes in wells, especially, I think, in the west of India, the Deccan, &c. In default of such spots they will breed in crevices and cavities of rocks, caverns, and sea-side cliffs; and I have often noticed that they are particularly partial to rocky cliffs by waterfalls. The celebrated falls of Gairsoppa are tenanted by thousands of Blue Pigeons, which here associate with the large Alpine Swift."

Where not disturbed they breed in incredible multitudes. At the grand old fort of Deig in Bhurtpoor, where, as in most parts of Rajpootana, they are sacred, and even a European who molested them would risk his life, several *hundred thousand* pairs must live and breed. A gun fired in the moat towards evening raises a dense cloud, obscuring utterly the waning day and deafening one with the mighty rushing sound of countless strong and rapidly-plumed pinions. Here for the first time I realized what the flights of *Ectopistes migratorius* in North America might be like.

From one single old kutchra well in the south of the Meerut District I netted one night over two hundred, and a good many others made good their escape.

Colonel G. F. L. Marshall says:—"I have often found the nests on edges of buildings. I have taken eggs in the Doab in April, May, and June, earliest in Saharunpoor, latest further south and east."

Lieut. H. E. Barnes, writing of Rajpootana, says that "by far the favourite site for the nest of the Indian Blue Rock-Pigeon is in holes of masonry wells."

Colonel Butler remarks:—"The Blue Rock-Pigeon breeds in the neighbourhood of Deesa I fancy the whole year round. They build usually in holes in wells, temples, buildings, &c., making a pad of sticks and laying generally two good-sized pure white eggs. I have taken nests in almost every month."

And subsequently he remarked:—"Belgaum District. Nests observed on the 24th October and 5th December, 1879, containing fresh eggs."

Captain Horace Terry remarks, speaking of the Pulney hills:—"A large colony on the cliffs near Pittur."

In Ceylon, Colonel Legge informs us, these Pigeons breed in the Trincomali District in May and June.

The eggs, to the best of my belief, are precisely similar to those of *C. livia*, and like them vary a great deal in size and a good deal in shape, from broad very perfect ovals, only slightly compressed at one end, to moderately elongated and occasionally rather pointed forms. They are very glossy, and of course pure white.

In length they vary from 1.2 to 1.65, and in breadth from 1.02 to 1.25; but the average of some sixty eggs measured was 1.45 by 1.12.

Subfamily PALUMBINÆ.

Alsocomus puniceus, Tick. *The Purple Wood-Pigeon*.

Alsocomus puniceus, Tick., *Jerd. B. Ind.* ii, p. 482; *Hume, Cat.* no. 782.

Mr. Oates writes from Pegu:—"Kyeikpadein, 27th July. Nest in a fork of a horizontal bamboo-bough, about 10 feet from the ground, composed of a few twigs woven carelessly together. Male bird sitting. One egg quite fresh. Colour white, very glossy. Size 1.47 by 1.15. Probably only one egg is laid."

***Alsocomus hodgsoni* (Vig.).** *The Speckled Wood-Pigeon.**Alsocomus hodgsonii* (Vig.), *Jerd. B. Ind.* ii, p. 403.*Dendrotreron hodgsonii* (Vig.), *Hume, Rough Draft N. & E.* no. 783.

I know nothing as yet certainly of the nidification of this species, the Speckled Wood-Pigeon, but should certainly have expected it to nest on trees. Captain Irby, however, remarks, in the 'Ibis' for 1861, that this species is "frequently seen in Kumaon in April and May; at that time *some nested in inaccessible cliffs* near Moonsheyaree, about seventy miles from Almorah."

This may be correct, but requires confirmation. Captain Cock told me that this species "breeds in Cashmere. In June I shot the birds, which were evidently breeding, in the Sonamerg Valley. I was not, however, fortunate enough to take their eggs, which we may, however, safely conclude to be of the usual type."

***Palumbus casiotis*, Bonap.** *The Himalayan Wood-Pigeon.**Palumbus casiotis*, *Bonap., Jerd. B. Ind.* ii, p. 464; *Hume, Rough Draft N. & E.* no. 784.

The Himalayan Wood-Pigeon or Cushat breeds, as far as I have yet ascertained, only in the extreme North-west Himalaya, and perhaps also in the higher fir-forests immediately below the snow in the Western Himalayas generally.

I have never found a nest. About Simla, Mussoorie, and Almorah they first appear about the beginning of November, and remain with us throughout the winter and until perhaps the middle of April, but they then disappear. Captain Hutton and Mr. F. Wilson quite confirm my experience. The former writes:—"It is a curious fact that, although in the depth of winter the Himalayan Cushat (*Palumbus casiotis*) is abundant both at and around Mussoorie, they are not in summer, when they leave us, to be found in the forests of our central region, although procurable in the higher tracts between the Jumna and the Sutlej. Of this I have been assured by Mr. F. Wilson, who informs me that, although he has at all seasons of the year explored the central forests between the Ganges and the Jumna, he does not remember to have seen this Pigeon in summer; it would therefore appear to wing its way, as the spring sets in, across the Jumna to the higher forests of the North-west, and this I believe to be the case with many species which, appearing to shun the tracts between the Jumna and the Ganges, are yet to be found in Sirmoor on the one hand and in Kumaon on the other to the east and west of us; but why this should be, unless influenced by the nature of the forests, remains to be discovered. In short, whatever may be the reason, it clearly proves that there are yet many things in the natural history of both heaven and earth that are still unknown to our philosophy."

Further west they are plentiful in summer and at low elevations. On the 20th May Captain Unwin took a nest containing

two nearly fresh eggs (which he very kindly sent to me) in the Agrore Valley, at an elevation of perhaps 2500 feet. The nest was a large loosely-built twig platform, built on a branch of a fir-tree near the trunk, about 30 feet up the tree.

From Murree Colonel C. H. T. Marshall records that "two nests of this species were taken about the middle of June. They breed in the Valley of the Jhelum, at a low elevation, in dense thorny jungles. The egg resembles that of the English Wood-Pigeon; size 1.65 by 1.15."

The late Captain Cock wrote:—"Captain Marshall and myself found this bird breeding near Murree in June. It makes the usual type of nest placed on bushes or small trees, never, according to our experience, at any great height from the ground; I should say that 12 feet was the usual height. The eggs are white and very large."

Major Wardlaw Ramsay says, writing of Afghanistan:—"The Himalayan Cushat is not generally common in the Hariab District. In one spot, however, in the pine-forest between the main range of the Safed-Koh and the village of Ali Kheyl a large flock could always be found in the month of April. By the middle of the next month they had all paired. I found several nests, but was not able to obtain the eggs."

And Lieut. H. E. Barnes, also writing from Afghanistan, says:—"I did not see the Cushat until midwinter, when they appeared in vast flocks, and continued abundant until the commencement of June, when they retired to the hills and commenced breeding. The eggs are small for the size of the bird, only measuring 1.53 by 1.13. They are pure white, without the slightest tint of ivory, and are fairly glossy."

The few eggs of this species that I possess are very similar to, but as a rule slightly smaller than, those of the European Wood-Pigeon (*P. palumbus*). The eggs are scarcely larger than those of *C. intermedia*, but they are longer and narrower, much more elongated ovals, in fact, than those of this latter species. The eggs are, of course, pure white, with only in some specimens the faintest possible creamy tinge, and they have a fine gloss. The shells are not very fine, but exhibit over the whole surface an infinite number of minute pores, similar to, but far less conspicuous than, those of the eggs of so many of the Game-birds.

In length they vary from 1.53 to 1.65, and in breadth from 1.06 to 1.2.

Palumbus elphinstonii (Sykes). *The Nilghiri Wood-Pigeon*.

Palumbus elphinstonii (Sykes), *Jerd. B. Ind.* ii, p. 465; *Hume, Rough Draft N. & E.* no. 786.

The Nilghiri Wood-Pigeon breeds in many of the better-wooded localities of the Blue Mountains, at elevations of 5000 feet and upwards. They build the usual stick-nest—a very slight platform

placed on some stout bough of a large tree in the midst of dense forest.

The breeding-season appears to extend from March to July, and they lay a single egg only.

Writing from Kotagherry, Miss Cockburn says :—"The nest of the Nilghiri Wood-Pigeon resembles that of all Pigeons and Doves in the careless manner in which a few sticks are put together. On high trees in dense woods this bird prepares the abode for her young, and chooses a projecting bough, as if she had some thought for the safety of the egg she lays (I say *egg*, for I have seen four nests of the Nilghiri Wood-Pigeon: two had *one egg* in each, and the other two contained *one* young one in each). I have also remarked that only *one* Pigeon is noticed near the nests, which are to be found in the month of April."

Subsequently Miss Cockburn herself sent me, and Mr. Davison brought me, eggs taken in June. The latter remarks :—"This Wood-Pigeon breeds on the Nilghiris and its slopes, breeding rather late in the year. The nest, which is merely a platform of dried twigs, is usually placed in some thick thorny bush or mass of cane from about 12 to 20 feet from the ground. I believe that this Pigeon, like the other large Fruit-Pigeons, only lays one egg; occasionally it *may* lay two, but if so this must be, I think, quite exceptional."

Mr. Rhodes W. Morgan, writing from South India, says :—"It breeds in March and April in the dense woods of the Nilghiris, depositing its single glossy-white egg on a loosely constructed platform of sticks some 8 or 10 feet from the ground."

Captain Horace Terry says, writing of the Pulney Hills :—"Common on most of the big *sholas*. Obtained a nest with one egg at Kukal on the 17th May."

The eggs are very perfect ovals, usually broad, sometimes slightly elongated. They are, of course, pure white, spotless and glossy, and absolutely undistinguishable from very large eggs of *C. intermedia*, though, of course, considerably larger than the average of these.

The specimens I possess vary from 1·46 to 1·55 in length, and from 1·07 to 1·2 in breadth.

***Palumbus torringtoni*, Kelaart. *The Ceylon Wood-Pigeon*.**

Palumbus torringtoni, *Kel.*, *Hume*, *Rough Draft N. & E.* no. 786 *bis*.

"The habits of this Pigeon," writes Dr. Kelaart, "are strictly arboreal; it flies high and swiftly. It comes to Newera Elia to breed, and I have seen a nest with only one egg as large as that of the domestic Pigeon. The stomach contained fruits of the *Nelon*."

Colonel Legge writes, in his 'Birds of Ceylon':—"I was never fortunate enough to find this Pigeon's nest, nor to obtain much

information from my friends in the Central Province concerning its nesting-habits. Mr. Bligh writes:—"I have seen their nests both in spring and autumn as late as October; they generally build in lofty forest trees, but I once frightened a large young one from a nest on a small tree some 15 feet above the ground."

Subfamily TURTURINÆ.

*Turtur pulchrala** (Hodgs.). *The Indian Turtle-Dove.*

Turtur rupicolus (Pall.), *Jerd. B. Ind.* ii, p. 476.

Turtur pulchrata (Hodgs.), *Hume, Rough Draft N. & E.* no. 792.

Our Indian Turtle-Dove breeds throughout the lower ranges of the Himalayas, from Afghanistan to Sikhim at any rate, at elevations of from 4000 to 8000 feet. It is for the most part only a summer visitant to these hills. A few pairs linger during the winter in the lower valleys, but the great majority migrate at this season to the Central Provinces and Central India, where it may at times, in the cold weather, be found associated with the next species.

T. pulchrala lays throughout the summer. I have found eggs early in May and late in August, but the great majority lay in June. It makes a loose, but rather more substantial, twig nest than many of its congeners, placed on some horizontal branch of a large tree, usually not far from the extremity.

Colonel C. H. T. Marshall, writing from Murree, says:—"This species breeds in June in the pine-forests, but I have found their nests in all kinds of trees. The eggs are invariably two in number. I conclude, from the very different dates on which I have found the eggs, that they have two broods, but I am not certain of the fact."

Captain Hutton (who, however, miscalled the bird *T. meena*) says:—"This also is a mere summer visitor at Mussoorie, where it arrives early in April, when every wood resounds with its deep-toned cooing. It is not found lower than 6000 feet there, and departs in October. At Mussoorie it breeds in May, making a platform-nest on tall forest-trees. The eggs are two and pure white."

Captain Cock noted that the Indian Turtle-Dove "breeds near Murree and in Cashmere on trees and bushes, at no great height from the ground, in May and June, laying two eggs of the usual Dove-type, in the usual slight stick-nest of the family."

The eggs of this species are like those of all its numerous allies—regular ovals, pure white, and very glossy. In size they

* It is evident from Hodgson's drawings and MS. that he named this bird *pulchrata*, and not *pulchrala*.—ED.

exceed those of *T. risoria*, and are slightly smaller and decidedly less pointed than those of *Crocopus phasianopterus* and *C. chlorigaster*.

In length they vary from 1.1 to 1.34, and in breadth from 0.85 to 1.0; but the average of twenty-one eggs is 1.22 by 0.93.

Turtur meena (Sykes). *Sykes's Turtle-Dove*.

Turtur meena (Sykes), *Jerd. B. Ind.* ii, p. 476; *Hume, Rough Draft N. & E.* no. 788.

Sykes's Turtle-Dove is, as far as I have been able to ascertain, a permanent resident of the hilly portions of Southern India, of the broken belts of hills and forests that stretch across the continent of India from the northern portion of the Western Ghâts to Cuttack; thence it extends into Eastern Bengal, Cachar, Assam, and along the bases of the Himalayas (which it does not ascend to an elevation of above 4000 feet) as far west as the Sikhim and Nepal Terai, and again southwards into Arracan, Pegu, and the north of Tenasserim.

It appears likely that they lay from December to April.

Mr. V. Irwin sent me a couple of eggs from Hill Tipperah, taken at the end of March; and Mr. F. R. Blewitt says:—"This species certainly breeds in December and January. In the beginning of the latter month a pair of young birds was brought to me from the magnificent forest-covered hills some fifteen miles south of Sumbulpore.

"Here I found the birds in great numbers, and in the early mornings and evenings the forests resounded with their thrice-repeated deep guttural 'coo,' so unlike that of other Doves.

"At this time the Doves were single or in pairs—a certain indication of the breeding-season. My experience leads me to suppose that this species congregates in flocks after the breeding-season, for in March 1869 I found a flock some twelve miles south of Seoni (Central Provinces).

"It was, I think, on the 2nd January that the young birds were brought to me; and exactly six weeks later the female laid her first egg, and the second two days later, in the made nest of cloth and cotton previously placed in the cage. The birds did not, I should note, sit on these eggs, neither on those subsequently laid by the female in March, April, and May, when she ceased to lay. The man who brought me this pair returned two days after with a nest and two eggs, which he very positively declared to belong to this species. He had secured them in the forest from whence he had brought the young ones. Though I did not myself take this nest, I saw no reason to doubt the man's statement. The birds were in great numbers and were certainly breeding, and I feel certain that the eggs and nest were really of this species. The latter was neatly constructed of twigs, circular in shape, with the egg-cavity somewhat deep, certainly unlike the 'platform-nest' described by

Captain Hutton *. The pair I have are very tame, and the coo of the male (I have not heard the female) is far oftener heard of a morning and evening than during the day. When irritated they utter a peculiar loud hissing kind of note. I have not met with this Dove in the Raipoor District, though very likely it is to be found in the ranges of hills west and south."

The eggs of this species, sent me by Mr. Irwin from Tipperah and from Raipoor by Mr. Blewitt, vary a good deal in size, and are, just like so many other Doves' eggs, more or less broad regular ovals, pure white, and fairly glossy.

They seem to average a good deal smaller than those of *T. pulchrala*, but then most of my eggs were laid in confinement by a young bird. They vary in length from 1.05 to 1.23, and in breadth from 0.86 to 0.95.

Turtur senegalensis (Linn.). *The Brown Turtle-Dove.*

Turtur cambayensis (Gm.), *Jerd. B. Ind.* ii, p. 478; *Hume, Rough Draft N. & E.* no. 794.

The Brown Turtle-Dove breeds pretty well all over the plains of India and in the outer ranges of the Himalayas to an elevation of 4000 or 5000 feet.

The earliest nest I ever obtained was at Etawah on the 1st January, and the latest at Agra on the 2nd August: the first contained one, the second two fresh eggs.

The nest is a very slight one, commonly placed in low trees or shrubs, often thorny ones, at no great height from the ground, but occasionally about the roofs or in niches of buildings. The nest is composed of thin twigs, grass-stems, and sometimes a root or two, but has no lining.

They build at times in palms. I have found several nests of this species in the bristling crowns of young wild date-trees (*Phoenix sylvestris*).

They have certainly two broods, and often, I think, three, in the same nest, successively.

Two is the regular complement of eggs, but I have very often found only one incubated, or a single young bird, in a nest.

Mr. A. Theobald writes:—"On the 15th August, at the Salem railway-station, I found a nest of this bird placed between the leaves of a plant of the *Agave americana*, not above three feet from the ground. The nest was the usual irregular platform of dry pieces of grass-stems and small thin twigs carelessly put together, and contained the usual two milk-white eggs; but the situation seemed to me to be unusual."

The late Mr. A. Anderson remarked:—"Our four species of

* Hutton's bird was *T. pulchrala*, not *T. meena*. He sent me both birds and eggs; and, as a fact, *T. meena* never occurs about Mussoorie.

resident Doves require little or no comment as regards their nidification, for there is a painful *sameness* about their nests, and no one cares to have a series of pure white eggs. There is this difference, however, that while *Turtur risorius* and *T. cambayensis* court human habitations, *T. suratensis* and *T. humilis* show a decided predilection for building in shrubs, hedge-rows, and even trees.

"In 1863 I had occasion to have a standing camp for some ten days; and a pair of *T. cambayensis* soon discovered what appeared to them an eligible site for a nest in the verandah of my single-pole tent. At first I kept the inner *chicks* invariably down at the side the Doves used to enter from, so as to allow them to construct their nest unmolested, but in the course of two or three days this precaution was quite unnecessary.

"The nest, if such it can be called, was placed close to the fringe of the *kunnaut*, on one of the corner ropes, where it is double for some six inches, and there knotted. The double portion was just broad enough, being three inches apart, to support the nest with careful balancing; the *knot* acted as a sort of *buffer*, and prevented the twigs from sliding off, which most assuredly would otherwise have been the case, for the rope just there was at an angle of 45°. My tent had to be struck before the eggs were laid.

"On another occasion a pair of these Doves built on the outer ledge of a glass window-sill in my office-room, where I had ample opportunity for observing their habits: both birds took their turn pretty equally on the eggs, as also in feeding their young; the male bird frequently fed the female as well.

"I believe that Doves rear several broods during the year; I have found them breeding at all seasons."

Writing from Mussoorie, Captain Hutton tells us that the Brown Turtle-Dove "arrives at 5000 feet, like the others, about March or April, departing again in autumn. Its eggs are two and pure white. I have observed in this, as well as in the foregoing different species of *Turtur*, a tendency in the eggs to become suddenly pointed or slightly nipple-shaped at one end."

Lieut. H. E. Barnes writes from Afghanistan:—"The Little Brown Dove is not very common during summer, and between October and March I did not see a single specimen. I found them breeding in May."

And later on, when in Rajpootana, he said:—"The Little Brown Dove breeds throughout the year; it shows a decided preference for prickly-pear bushes, as I found twenty nests in them to one elsewhere."

Major C. T. Bingham remarks:—"Breeds at Allahabad from February to July, and at Delhi from March to end of August. It is very familiar, and a pair had their nest on the top of a beam in my office. Nest is a very slight structure of stiff grass-roots."

Colonel E. A. Butler writes:—"The Little Brown Dove breeds in the neighbourhood of Deesa in almost every month in the year. I have taken nests in February, March, April, May, June, July, August, September, and October. The nest is usually placed in

some low tree or bush or in a cactus-hedge, and consists of a very scanty allowance of dead sticks scarcely sufficient to support the eggs, which are invariably visible through the bottom of the nest. I have never found more than two eggs in one nest. I found two nests in Deesa on the 23rd of May containing incubated eggs in a very curious situation. A net about two feet wide had been hung round the inside of a verandah to prevent bats from entering the roof; upon this net the two nests were built about two yards apart, and when disturbed the old birds had to flutter along the net for 9 or 10 yards before they could make their escape. I think August and September are the principal months in which they lay."

Mr. Benjamin Aitken sends me the following note:—"Jerdon says that the species of the Pigeon family never lay more than two eggs. Now I have twice, in Berar, had a Dove's nest brought to me with *three* eggs, and by no cross-questioning could I shake the natives who brought them in their declaration that the three eggs were found, each time, in the same nest.

"I once found a nest of *T. senegalensis* in a most unusual situation. It was on the ground, at the top of a ditch, in a plain covered with short grass, either spear-grass or some very fine sort like spear-grass. Not a stick or straw had been carried to the spot, but the grass as it grew had been worked into a very neat nest. The parent-bird was constantly about the nest, or sitting in it; but just as I was expecting an egg the little structure was destroyed, either by men or cattle. This was in Berar about the middle of November."

These eggs are, as usual, pure white and commonly very glossy. They vary comparatively little in shape, though a good deal in size, and are typically rather broad, nearly perfect ovals. Although in all this family the size of the egg varies greatly, those of this species are, as a body, smaller than those of *T. pulchrala*, *Chalcophaps indica*, and *T. suratensis*, but about the same size as those of *T. tranquebaricus*. They are a very pure white, seldom, if ever, exhibiting that creamy tinge typical in *T. tranquebaricus* and not uncommon in *T. risorius*.

In length the eggs vary from 0·88 to 1·18, and in breadth from 0·75 to 0·9; but the average of forty eggs is 1·01 barely by 0·86 full.

Turtur suratensis (Gm.). *The Spotted Dove.*

Turtur suratensis (Gm.), *Jerd. B. Ind.* ii, p. 479; *Hume, Rough Draft N. & E.* no. 795.

The Spotted Dove breeds almost throughout the more humid and better-wooded portions of India, alike in the plains and in the hills up to elevations of 5000 or 6000 feet. It eschews, as a rule, those provinces and districts where the rainfall is scanty, and in Upper India chiefly affects the sub-montane districts, whence, as summer approaches, many migrate to the lower forest-clad hills

and valleys, where also a good many are permanent residents. In dry tracts, such as Cawnpoor, Etawah, and Agra, they are but rarely seen, and still more rarely found breeding (though I did once find a nest in Etawah), while at Bareilly, Bijnour, and Shah-jehanpoor they are the commonest Dove, so common that I have taken a dozen nests at the first-named station in a morning. The nests are slight and loosely put together, of thin twigs, with a few roots or a little grass, and are placed as a rule in any shrub or low tree, apparently quite at haphazard, but usually at no great height from the ground, and very often within reach of a man's hand. Occasionally a nest will be found in ruined buildings or in some wide open cavity in a tree, but never much overshadowed. The birds seem to like light and air greatly, and in most cases affect no sort of concealment, but build their nests in the most open and visible situations, and stick to them most fearlessly until absolutely forced to leave.

They lay invariably, so far as my experience goes, two eggs, and have always two, and often, I believe, several broods during the year, and these too, if not disturbed, in the same nest.

Captain Unwin remarks:—"I took a nest of this species, containing two fresh eggs, on the 29th April, in the Agrore Valley, shooting the male as he flew off the nest. This was placed about three feet from the ground in a thick tangled bush which overhung a watercourse."

From Murree, Colonel C. H. T. Marshall tells us that the Spotted Dove breeds in the surrounding hills, as well as in the plains below.

From Mussoorie, Captain Hutton writes that this species is "abundant in the Dhoon, and arrives in the hills in the end of March, leaving again in the autumn. It breeds at about 5000 feet, and lays two white eggs. Captain Tickell says:—"Eggs two to six"; I have never *seen* more than two in any nest."

Writing from Kumaon, Mr. R. Thompson remarks:—"The Spotted Dove is the most common and abundant of the family in the Lower Himalayas, remaining in the lower hills throughout the winter, and is a hardy, easily domesticated bird. I have had some which have lived in captivity for years, and even bred in a large cage.

"The nest is composed of from about fifty to one hundred and fifty small twigs and roots laid loosely together, that portion of a bush or tree being selected for the purpose which will give the broadest foundation, no matter whether it be the intertwining of many slender branches or a hollow in a thicker one.

"The breeding-season commences as early as February in the warmer valleys, and continues to the end of October. Two or even more broods are reared during the season.

"The eggs are pure white and two in number, and nearly perfectly oval. The young remain in the nest till able to fly, when they come out and perch in the branches, but are easily frightened out of the nesting-tree on the approach of a person, and not being

able to sustain a protracted flight can easily be taken, if followed up.

"The Indian Corby (*Corvus macrorhynchos*) is a vile and bitter enemy of this and all the other Doves, prosecuting his search for their eggs and young ones with most unflagging energy. The Common Magpie (*Dendrocitta rufa*) also is another great thief of eggs.

"On a nest being robbed the parent birds will forthwith set to work and build another, and if that be robbed in its turn they will still go on seeking new sites, building new nests, and laying fresh eggs.

"The female sits very close on her nest, but if forced from it she will at times fly, or in fact throw herself down on the ground before the intruder, and will then mimic before his astonished gaze all the actions and efforts of a wounded bird trying to escape its pursuers, and thus endeavour to turn him from the nest.

"In their selection of sites for their nests these birds show very little intelligence, suiting themselves to the first place they find handy, often amongst old furniture in the verandah of a house, cornices of old buildings, low hedges and bushes, or even the lopped trunk of a tree, if a flat surface is left sufficient to place the nest on, and often in the most exposed situations, where the wretched birds are sure to pay the penalty of their imprudence."

This species, according to Mr. Hodgson, breeds almost throughout Nepal, laying from February to May. He notes:—

"April 22nd, Jaha Powah.—Two nests in the midst of small trees, a rude congeries of hard twig-like grasses and grass-like twigs. One fresh white egg in each."

Mr. Gammie says:—"Breeds freely in the lower hills of Sikhim. On the 20th May I took a nest near Mongphoo, at an elevation of about 3000 feet. It was a mere apology for a nest—a loose pad through which the eggs could be seen from below, 5 inches in diameter and less than an inch in thickness, composed of roots and a few fine creeper-stems excessively loosely put together. It was placed in a small tree and contained two much-incubated eggs.

"I have found this species breeding in May and June from the plains up to 4000 feet. The nest is always of the same type, made of twigs, and the eggs two in number. It is not a permanent resident of the hills, but comes up from the plains in early spring and leaves in November. It is never found in forests, and prefers places that are well covered with native crops with a few standing trees about. It is most destructive to the dry-ground rice, buck-wheat, and other crops."

Lieut. H. E. Barnes writes from Rajpootana:—"The Spotted Dove has not such an extensive breeding-season as the Little Brown Dove; indeed, I have only found nests in September."

Colonel E. A. Butler remarks:—"The Spotted Dove is by no means common in the neighbourhood of Deesa, and, as far as I know, only occurs here in the rains and cold weather. In the more wooded parts and in the tank country it is tolerably abundant.

I found two nests at Milana, 18 miles from Deesa, on the 18th and 20th September respectively. I saw another nest on the side of the road to Ahmedabad on the 15th October."

Mr. J. B. Cripps, writing from Furreedpore in Eastern Bengal, says:—"Excessively common and a permanent resident. In several instances I have found its nests well concealed in cane-brakes and bushes; the majority of nests, however, are well exposed to view on bushes, bamboo-clumps, and small trees, and never at any great height from the ground. It is a wonder how they ever rear any young ones, considering how low and exposed the nests generally are. From November to May seems to be the favourite time here for laying; never more than two eggs in a nest, nor have I seen a nest used for a second clutch."

Mr. G. Vidal, referring to the S. Konkan, writes:—"The common Dove of the district, abundant everywhere from coast to Ghâts. Nests with eggs taken in October, January, and April."

From Kotagherry, Nilghiris, Miss Cockburn writes:—"Doves are very careless in the construction of their nests, and this species forms no exception to the rule. A few small thin twigs, rudely put together, in a low branch at the edge of a thicket, or in some bramble-bush, so slightly shaded by leaves that the nest can be easily seen by the most casual observer, are the places invariably chosen by these inoffensive birds; they never appear to suspect that mischief may befall their nests. I have often had my eye fixed on a Dove for some minutes while she was sitting on her eggs, and still she would not leave her nest. These Doves build in the months of March and April, and never lay more than two white eggs; and if one be taken, the birds desert the nest."

Mr. A. G. Cardew, C.S., writes:—"Very common on the Nilghiris, where it breeds from February to September."

"In the Western Province" of Ceylon, says Colonel Legge, "this Dove breeds from March until June, after which it, no doubt, lays again, for the eggs may be taken almost at any time of the year."

The eggs vary very greatly in size, and decidedly average less than *T. risorius* and *T. pulchrala*. They are typically the usual broad oval, but, as in other kindred species, elongated and pointed varieties occur. They are pure white and glossy.

The eggs vary in length from 0.95 to 1.17, and from 0.75 to 0.95; but the average of thirty-three eggs is 1.06 by 0.82.

Turtur tigrinus (Temm.). *The Malay Spotted Dove.*

Turtur tigrina (Temm.), *Hume, Rough Draft N. & E.* no. 795 bis.

Writing from Upper Pegu, Mr. Eugene Oates remarks that this bird is "common everywhere except on the hills, where I did not meet with it. It seems to breed at all times of the year. Two eggs measure 1.21 by 0.88 each. They are of course pure white.

The nest is generally placed low, i. e. under 15 feet from the ground, in bamboo bushes or shrubs."

Again, writing from Wau in Lower Pegu, he remarks:—"The nest of this bird is to be found all the year through. It is a common bird in the plains, but becomes rather rare in the various hill-tracts. The nest is built flimsily of fine twigs, so loosely put together that the eggs may be seen from below. It is generally placed in thick bamboo brakes at various heights, but most frequently at from 10 to 20 feet from the ground. Eggs invariably two in number. A good thick jujube-tree is often chosen by this bird for the purpose of nesting."

Two eggs sent me by Mr. Oates measure 1.2 by 0.88, and 1.22 by 0.77.

Mr. Davison notes from Tenasserim:—"I found a nest of this Dove on the 21st January, 1875, at Pakchan; it was the usual Dove's nest, a platform of a few dry twigs placed in the middle of a thorny bush, about four feet from the ground. The bush grew on the very outskirts of some secondary jungle, and only a very short distance from a large extent of paddy flats."

The eggs obtained at Pakchan, Southern Tenasserim, by Mr. Davison measure 1.13 by 0.78 and 1.12 by 0.78.

Major C. T. Bingham, also writing from Tenasserim, says:—"On the 19th April I found a nest of the above species of Dove, shooting the female. The nest contained one fresh egg, and a second ready for expulsion I found in the bird. The nest was placed on a bamboo growing horizontally over a stream near the village of Hpamee in the Meplay District, and was of the usual careless Dove type."

Mr. J. Darling, Junior, notes:—"15th March. A nest of *Turtur tigrinus*, containing two eggs a little set. It was built entirely of twigs. Those comprising the foundation about as thick as a crow-quill, and those on which the eggs rested about half as thick.

"It was merely a platform about 6 inches in diameter, with scarcely any central depression, and was built in a broad-leaved low tree (the nest resting on one of the leaves), 3 feet from the ground. This nest was taken on a range of hills east of Tavoy, Burma, at an elevation of about 800 feet."

The eggs are moderately elongated ovals, sometimes rather cylindrical, sometimes rather pointed at one end, with occasional still further abnormal deviations from the type. The shell is very fine, and has a fair amount of gloss. In colour they are of course white and spotless; generally the white is quite pure, but at times an egg is met with exhibiting an extremely faint ivory or creamy tinge.

Turtur risorius (Linn.). *The Indian Ring-Dove.*

Turtur risoria (Linn.), *Jerd. B. Ind.* ii, p. 481; *Hume, Rough Draft N. & E.* no. 798.

The Indian Ring-Dove breeds throughout the plains of India,

and in the hills also, up to elevations of from 2000 to 5000 feet, according to locality. Jerdon says that it does not occur in the countries east of the Bay of Bengal, but it is really found in Upper Pegu at any rate, and the nest has been taken at Thayetmyo.

As for the breeding-season, we may say—

“Crows have their time to build, and Larks
For breeding and connubial love,
And other birds to lay and hatch—but thou,
Thou hast all seasons for thine own, O Dove!”

I myself have taken the eggs in every month from December to August, and I have no doubt that others have found them (though the bird is so common that no one writes about it) in the remaining quarter.

The nest is placed on any bush or tree, prickly and thorny sites, such as are afforded by the *Zizyphus*, wild date, babool, *Euphorbias*, &c., being often, but by no means universally, selected. Generally the nest is within 15, not very rarely within 5 feet of the ground, but again I have found it 30 or 40 feet up in a large tree. The nest is placed indifferently in a fork, in amongst numerous prongs, on a broad horizontal bough—anywhere in fact where a secure and sufficiently wide basis can be found, and is usually a mere platform some 6 inches in diameter, composed of thin twigs and lined with grass-stems, with a slight depression in the centre. Occasionally the nest is rather more saucer-like, a few roots or grass-stems are not unfrequently intermingled, and I have seen nests composed wholly of grass.

Like our other Doves, they lay two eggs as a clutch, and rear several successive broods.

Captain Hutton says:—“This is common in the Dhoon at all seasons, but only visits Mussoorie during summer, arriving on the hills about the end of March and returning to the plains in October. It breeds in April, May, and June, making a loose platform-nest of dried twigs with a few roots within. The eggs are two in number and pure white.”

Mr. A. Anderson writes:—“Since forwarding my former notes on the nidification of Doves generally, I have discovered a curious nesting-site for *Turtur risorius*, viz., the bare ground. On the 20th November (of the present year), while drawing sandy downs, covered with low flowering grass, such as the desert fox delights in, a Dove was flushed from off her nest, which contained a pair of fresh eggs. These clearly belonged to *T. risorius*, but not having seen the bird myself, and identification in a case of this sort being a matter of absolute necessity, I replaced the eggs, and subsequently shot one of the parent birds.

“The nest, if such it can be styled, consisted of a few dry twigs and grass-stalks which rested on the bare sand. There was no tree nearer than a mile, but the ground on all sides was covered with grass-seeds, which constitute the chief food of these birds; and this pair were evidently sensible enough to adapt themselves

to the force of circumstances, even at the expense of being considered somewhat eccentric in their selection of a site for their homestead."

Major Bingham remarks:—"Breeds nearly all the year round, both at Allahabad and at Delhi."

Lieut. H. E. Barnes writes from Afghanistan:—"The Common Ring-Dove arrives about the second week in March, and breeds during May, at which time they literally swarm."

Colonel Butler writes:—"The Common Ring-Dove breeds in the neighbourhood of Deesa and Mount Aboo from March to September, but the greatest number of nests are built about the second week in August. The nests are usually placed in low thorny trees or bushes about 6 or 8 feet from the ground, sometimes higher. The earliest nest I have noted was taken on the 15th March, and the latest 25th September."

Lieut. H. E. Barnes, writing of Rajpootana in general, says:—"The Common Ring-Dove breeds from October to July; at least, I have taken eggs in each of these months, but I believe that had I searched I should have found them during the remaining months."

Messrs. Davidson and Wenden, referring to the Deccan, say:—"Common and breeds."

Mr. J. R. Cripps, writing from Furreedpore in Eastern Bengal, says:—"Excessively common and a permanent resident. The birds of the year have the back of a deep vinous grey. This species breeds from December to July in small bushes and trees at from 6 to 12 feet from the ground in very exposed situations; the nest is a mere apology of twigs, and never contains more than two eggs. When the crops are being sown here this species congregates in small flocks of 10 to 30. I once shot one of these birds while it was flying past with a flock of Blue Rock-Pigeons."

The eggs are usually broad and perfect ovals, white and glossy. They vary a good deal in size; but as a whole are, excepting those of *T. pulchrala*, the largest of all our Doves' eggs. Although many might be correctly enough described as pure white, yet, when contrasted with the eggs of the Blue or Green Pigeons, the vast majority of them are seen to have a just perceptible ivory tinge. This is not so conspicuous as in the eggs of *T. tranquebaricus*, but still it exists.

In length they vary from 1.05 to 1.25, and in breadth from 0.85 to 1.0; but the average of fifty-eight eggs is 1.16 nearly by 0.92 full.

Turtur tranquebaricus (Herm.). *The Western Ruddy Dove.*

Turtur humilis (Temm.), *Jerd. B. Ind.* ii, p. 483; *Hume, Rough Draft N. & E.* no. 797.

The Western Ruddy Dove breeds in all parts of India, but is very capriciously distributed, and I am unable to say what kind of

country it prefers, and why it is common in one district and rare in a neighbouring one in which all physical conditions appear identical.

It is very common in the bare arid treeless region that surrounds the Sambhur Lake. It is common in some dry well-cultivated districts, like Etawah, where there are plenty of old mango groves. It is very common in some of the comparatively humid tracts, like Bareilly, and again in the Sâl jungles of the Kumaon Bhabur and the Nepal Terai. On the other hand, over wide extents of similar country it is scarcely to be seen. Doubtless there is something in its food or mode of life that limits its distribution, but I have never yet been able to make out what this something is.

Eggs may be found any time between January and July, but my impression is that normally they have only two broods, and lay for the first as a rule in January, for the second in May or June.

I have always found the nests at or near the extremities of the lower boughs of very large trees, at heights of from 8 to 15 feet from the ground, and laid across any two or three convenient horizontal branchlets. As a rule, the nests are excessively slight structures, composed of a few slender sticks or grass-stems, or both, so loosely and sparsely put together that the eggs can generally be spied from below through the bottom of the nest.

Two is the number of the eggs.

I reproduce an extract from a paper on the nidification of this and other species which I contributed some years ago to 'The Ibis.' It was written from Bareilly in June:—"One more piece of good luck yet remained for us. For weeks I had known that our smallest Dove, the beautiful little *Turtur humilis*, was sitting. Everywhere the males, conspicuous in their tender lilac-grey suit with rich ruddy vinous mantle and black velvet necklaces, were to be seen busy on the grass, but not a single lady was visible—obviously the white kid was on the knocker, if only one could find the house, but this had fairly puzzled us. Just as I was entering the bungalow and taking a last loving glance at the fair face of nature, so soon to be hidden from me by dingy rooms and fallow faces of disputatious counsel, just as I was drinking in the merry song of the Bulbul, soon to be drowned in monotonous and everlasting pleadings, purporting to show cause for and against everything in creation, I distinctly saw a female *humilis* fly down to her mate off the extremity of one of the lower branches of a huge patriarchal mango-tree. My court was to open at ten, and a great case (all about nothing by the way, simply a vent to the feelings of two irascible bankers who were too fat to turn out and fight out their mutual antipathies like men) was to come on. Nine had struck, I had breakfast to get, and I make it a rule as judge (new brooms always sweep clean, my friends say) to be in my seat by the last stroke of the hour; nevertheless I ran off to the tree like any boy and began to scrutinize the branch. After a minute I saw the eggs, two in number, exactly over my head, and apparently sus-

pended by only a few cross-threads. I got a high pair of platform steps, used here by masons when whitewashing ceilings, with us a very common operation, and mounted to the nest. It was a tiny network of grass-stems so slightly put together that, as I mentioned above, the eggs were clearly visible from below. How eggs could be hatched in such a situation I am at a loss to understand. The slightest storm, and we have had several such lately, would, I should have fancied, fling the eggs far away; but there they were, fresh and unsullied. They were considerably smaller than those of our other common Doves, and distinguishable by a very faint creamy tinge, scarcely noticeable except by contrast with those of the other species. Taken alone, you would say they were pure white; placed beside the others, you would instantly notice in them a very faint ivory-like tint altogether wanting in the rest."

According to Mr. Hodgson, this species lives and breeds in the lower valleys and the Sal forests of Nepal, and lays from January to May two or three white eggs. I myself never saw or heard of more than two eggs being found in any nest.

Lieut. H. E. Barnes, referring to Rajpootana in general, says:—"I only found nests of the Buddy Ring-Dove in November, so that its breeding-season seems much more restricted than is generally the case with Doves."

Colonel Butler writes from Deesa:—"I found a nest of the Buddy Dove at Deesa on the 8th July, 1875. It contained one fresh egg. The nest was in an acacia-tree, about 10 feet from the ground, and consisted of as few sticks as safety would permit of for the support of the eggs. Two other nests, each containing fresh eggs, were in the same tree, only a few feet from the Dove's nest, one of *Lanius erythronotus*, the other of *Dicrurus ater*. I found two nests near the same place containing fresh eggs on the 16th August, and many others during the remainder of the month; several nests in the same locality in March, April, and May. A nest, 19th June, two fresh eggs; two nests on the 6th June, one containing three eggs. Nests very common from the middle of August to the end of September."

And subsequently from Sind:—"Arrives in large numbers in the neighbourhood of Hyderabad, Sind, about the end of April, and in the month of June I noticed nests innumerable on the babool trees below the camp. On several occasions I have seen three eggs in a nest, and once or twice three young birds."

Writing of the Deccan, Messrs. Davidson and Wenden say:—"Common and breeds."

Mr. J. R. Cripps tells us that in Furreedpore in Eastern Bengal this Dove is "far from common; frequents woods more than either of the other two preceding species, I have seen them all the year round, but only in pairs. On the 10th June, 1878, I saw a nest in course of construction; it was built in the centre of a clump of bamboos near a ryot's house, and about 10 feet off the ground; the birds deserted it eventually."

The eggs (as a body, the smallest of all our Doves' eggs, except

those of *T. senegalensis*, which are of much the same size) are, I think, typically slightly more elongated ovals than those of our other Indian species of this genus. They are of course spotless and glossy, but though I have myself taken pure white ones, by far the greater majority of them are of a pale ivory-white, which is very conspicuous when they are placed alongside China-white eggs, such as those of the Blue Rock-Pigeon. I may here notice, as a result of the comparison of large series of numerous species, that the eggs of Doves, as a body, appear to me to be slightly less glossy than those of Pigeons, and that while in all species of Doves occasional ivory-tinted examples occur, and in some species such tinting is the normal type of egg, no similar tinting is noticeable in the eggs of wild Pigeons—I say advisedly wild, because the eggs of birds, even originally wild ones, laid in confinement differ often widely from their normal types, and there is in India a race of Pigeons, one of the feather-footed ones (*Papoosh*), commonly known as the Bajah of Putteela's breed, whose eggs (at least to judge from those of the pair that I kept) are as distinctly of an ivory tint as those of the most characteristic egg of *T. tranquebaricus*.

In length the eggs vary from 0·98 to 1·1, and in breadth from 0·75 to 0·85; but the average of twenty specimens is 1·02 nearly by 0·8.

Subfamily MACROPYGIINÆ.

Macropygia tusalia (Hodgs.). *The Bar-tailed Cuckoo-Dove.*

Macropygia tusalia (Hodgs.), *Jend. B. Ind* ii, p. 473; *Hume, Rough Draft N. & E.* no. 791.

The Bar-tailed Cuckoo-Dove breeds in well-wooded hills and forests, at elevations of from 3000 to 6000 feet, in the Himalayas eastwards of the Ganges, extending along the various ranges eastwards and southwards to Hainan in China and the northern parts of Tenasserim, south of which another species hitherto identified with *M. ruficeps*, Temm., but which appears to me separable, and which I have called *M. assimilis*, makes its appearance.

According to Mr. Hodgson's notes this species lays in May and June in the central forests of Nepal. They build a large loose platform-nest of sticks on some horizontal branch, at no great height from the ground. A nest taken on the 20th May, which contained two fresh eggs, was a foot in diameter and 8 inches in thickness. The eggs are white, with at times a very decided creamy tinge, and one is figured as measuring 1·5 by 1·1.

Mr. W. Theobald makes the following remarks on the nidification of this bird in the neighbourhood of Darjeeling:—"Lays in the second week of July; eggs oval, size 1·40 by 0·98; colour dirty white; nest a few sticks."

Dr. Jerdon says:—"I found its nest on the Khasia Hills, at about 4500 feet, on trees, at a moderate elevation."

From Sikkim Mr. Gammie writes:—"In June I found four nests of this Dove, all with only one egg in each. They were of the usual construction, and placed in trees from 10 to 20 feet up, at elevations of from 2500 to 4500 feet above the sea."

Major Wardlaw Ramsay writes from the neighbourhood of Tonghoo:—"I found a nest containing two white eggs at 4000 feet in the Karen Hills on the 18th March. The eggs measured roughly 1·4 by 1 inch."

The eggs seem to run rather longer than those of the true Doves, and seem to have a tendency to be nearly equally pointed at both ends. The eggs are white, with a very faint creamy tinge, and one of them has, strange to say, a number of small olive-yellow specks and spots sprinkled pretty evenly over its whole surface. These are doubtless accidental stains accruing after the egg was laid, but they will not wash out.

The eggs have only a moderate amount of gloss, and measure 1·35 in length by 0·95 to 1·0 in breadth.

Subfamily PHAPIDINÆ.

Chalcophaps indica (Linn.). *The Emerald Dove.*

Chalcophaps indicus (Linn.), *Jerd. B. Ind. ii*, p. 484; *Hume, Rough Draft N. & E.* no. 798.

The Emerald Dove is essentially a bird of the forest and jungle, and will never be found at any great distance from these, though it may straggle away from its home for a score of miles during the day.

In suitable localities it breeds throughout our Indian Empire, the Nicobar birds separated by Bonaparte as *C. augusta* not being, as the large series I there procured conclusively proved, in any way different from the Continental form.

Throughout India it ascends well-wooded or jungle-clad hills to elevations of from 3000 to 6000 feet, according to locality, and is in most of these hills as much a permanent resident as in the forests that lie around their bases.

The earliest nest that I have ever taken was found near Dehra on the 25th February; the latest I secured at Bheem Tal in the height of the rains on the 2nd July.

I suspect, but do not certainly know the fact, that they have two broods.

The nests are placed in some dense bush or low thickly-foliaged tree in forest or jungle, rarely at any great height from the ground, usually just out of reach, but at times quite low. They are more regular saucers than those of other Doves, composed of roots, grass, or twigs, but comparatively neat, and, although devoid of

lining, with a decided central depression. They may measure from 5 to 6 inches across.

Two eggs, I believe, are always laid. I have seen many nests, but none contained more than this number.

Captain Hutton tells us that the Emerald Dove is "abundant in the Dhoon, frequenting low jungles. It is likewise a true hill-bird up to 5500 feet throughout the year. It is very partial to the seeds of the castor-oil plant (*Ricinus communis*). The nest is similar to that of Doves in general, being loosely constructed of roots and small twigs laid across each other with little arrangement, so as to form an open platform, which is placed in some low bush, at about two feet from the ground. The eggs are white and two in number. One nest was taken in the Dhoon in March, but others were also found later at Jeripanee (5500 feet). It flies very rapidly and twists and turns amongst the bushes, so as to render it somewhat difficult to shoot it. The nestling birds are spotted with rusty buff, somewhat resembling those of our Indian Turtle Dove."

At the Nicobars Mr. Davison "found this species breeding in the latter half of February and the beginning of March. The nests were placed in small trees, about 6 feet from the ground, or laid on the frond of a young cocoanut-palm at about the same elevation. The nests were built entirely of twigs, but rather more compactly than is usual with Doves; they were mere circular platforms devoid of any lining, and each contained two eggs."

Mr. J. Darling, Junior, writes:—"I found a nest of this bird at Vythery on the 7th March, 1873, in a jungle, on the thickly-foliaged branch of a tree, built of twigs, about 6 inches in diameter, with a sort of hollow for the eggs; it contained two young ones. I have noticed a great many old nests on the fronds of the wild cocoanut-palm, which never grows more than 12 or 16 feet high."

Mr. Bourdillon notes from South Travancore:—"Jan. 13th. Found a nest of this bird in a bush, 8 feet from the ground, with two eggs, very hard-set, white, 1.2 x 1 inch. Eggs very much like those of *Turtur risorius*, but slightly rounder."

Mr. C. J. W. Taylor records the following note from Manzeerabad in Mysore:—"Common. Eggs taken on the 10th January."

Colonel Legge, writing of Ceylon, says:—"In the Western Province I have shot the Beetle-wing in a state of breeding in June, but I have taken its eggs in the Kurenegala District in February, so that it probably breeds at no regular period, and very likely has more broods than one in the year."

The eggs vary from broad to moderately elongated ovals; some are rather conspicuously pointed just at one end. The shell is fine and fairly glossy. The colour varies from very slightly creamy white to white with a decided, though very pale, *cass-aw-lust* tinge. They are, of course, entirely free from all markings.

The eggs vary in size from 1.02 to 1.10 in length, and from 0.78 to 0.9 in breadth.

Subfamily CALCENINÆ.

Calenas nicobarica (Linn.). *The Hackled Ground-Pigeon.*

Calenas nicobarica (Linn.), *Hume, Rough Draft N. & E.* no. 798 ter.

The Nicobar or Hackled Ground-Pigeon, the most lovely species I really think of the whole group, breeds, so far as is yet known for certain, only in one island of the Nicobar cluster. It may breed in other links of that vast chain of islands which stretches down from the Nicobars to New Guinea; indeed it very probably does, and stragglers may nest on others of the Nicobars; but its *home*, its breeding headquarters, which we had the good fortune to discover, are in the little, almost absolutely inaccessible, island of Batty Malve.

Of this I said in my account of our cruise amongst the Nicobars ('Stray Feathers,' vol. ii, p. 95):—"The island appeared to be almost wholly composed of coral, resting unconformably on a base of sandstone. It was low, nearly level, bore a certain amount of high tree-jungle and a few patches of cocoanut, and was in most places covered by an excessively dense undergrowth of some thorny bramble-like shrub, here and there interspersed with a few open plots of grass. The moment the level of the island was gained, the mystery of the black birds was solved—they were Nicobar Pigeons, and this was *par excellence* the home and stronghold of this magnificent bird. Thousands were flying about from tree to tree, or feeding on the seeds of the undergrowth (with which we found their crops mostly full). Their nests were as thick upon the trees as ever nests are in a rookery at home. Young ones in every stage of growth, from naked blind things to birds fully fledged, were to be seen in or alongside the nests. They were perfectly tame at first, and fed about on the ground just like other Doves. Though silent birds as individuals, yet from their immense number their occasional *croak, croak* blended into a continuous murmur heard distinctly above the grinding surf.

"Hundreds might easily have been shot. As it was the whole party, Native and European, were loaded; and, despite unavoidable losses at the time of re-embarking, some seventy were safely brought on board."

Mr. Davison, who was one of the party, and zealously climbed numbers of the trees to scrutinize the nests more closely, has remarked:—" *Calenas nicobarica* builds a regular Pigeon's nest, and always on trees; on Batty Malve, where we found this bird in thousands, almost every thick bushy tree contained several nests. I counted thirteen on one tree, and I must have examined a couple of dozen of these nests. We visited the island rather

late. Nearly all the occupied nests contained young, and hundreds of young had left the nest. I only succeeded in finding two eggs, one partially incubated, the other ready to hatch off; the former of these unfortunately got broken on the island, the latter I succeeded in preserving by cutting a hole in one side, and then placing the egg in a small paper tray near an ants' nest. The nests were, as I have mentioned above, regular Pigeons' nests—merely a platform of twigs, very loosely and carelessly put together, and without lining of any kind, and in no single case contained more than one young one or one egg, so I think we may safely assert that the normal number of eggs laid by this bird is only one. Many of the nests I examined contained young ones only a day or two old, perfectly devoid of even down, and with closed eyes; in fact exactly like the young of the domestic Pigeon when first hatched: other nests contained young that flew from the nest on our climbing the tree. One nest I found was only 10 feet, but the others ranged from 20 to 30 feet from the ground, and were always placed in thick bushy trees.

"In the other islands that we visited in which this bird occurs, I could learn nothing as to whether they breed there or not, except on Katchall, where a native told me that they built on trees; but he could neither get me the eggs, nor could he even give me a description of them or of the number laid: probably it was merely a good guess of his that they built on trees, and that they do not really build on Katchall Island, but all resort to Batty Malve to breed. I certainly never met with any but adult birds on the other islands where they occur, but again, on the other hand, while most of the birds were breeding on Batty Malve, others, though only a few, were to be found on Katchall, Treiss, Track, &c."

The egg is of course spotless and pure white, but the shell, though compact, is very finely, almost microscopically, pitted all over, and it has scarcely a trace of any gloss. It measures 1·84 by 1·27.

Subfamily CARPOPHAGINÆ.

Carpophaga senea (Linn.). *The Green Imperial Pigeon.*

Carpophaga sylvatica (Tick.), *Jerd. B. Ind.* ii, p. 455.

Carpophaga senea (Linn.), *Hume, Rough Draft N. & E.* no. 780.

Captain Wimberley sent me two eggs of this Green Imperial Pigeon procured in the Andamans, near Mount Harriet, in July. Unfortunately no particulars as to nest, &c., were recorded, and it is not known whether both came out of the same nest or whether each was from a separate nest. The eggs are of the usual Pigeon type, broad ovals, very obtuse at both ends, unspotted white, with

a slight gloss, and with very fine compact shells. They measure 1·6 by 1·25, both being of precisely the same shape and size.

Mr. J. Inglis writes from Cachar:—"The Imperial Green Pigeon is common. It breeds during the rains. The only nest I have seen was in a thicket, about 30 feet from the ground. It contained two young birds newly hatched. The nest consisted of a very few sticks and a few stiff grasses."

Major C. T. Bingham, writing from Tenasserim, says:—"This common Imperial Pigeon I have seen in the north on the Yoonza-leen chông, on the Attaran, Gyne, and Houndraw rivers, but nowhere in such numbers as in July on the Salween, where in one day, driving them backwards and forwards between a few *Ficus* trees in fruit, I managed to bag over thirty.

"It is not rare in the Thoungyeen.

"On the 19th March, on the road from the village of Podresakai to Meplay, I found a nest of the above Pigeon with the usual solitary egg, which proved to be hard-set. It was easily seen from below through the flimsy nest of a few sticks and straws laid across and across a horizontally-growing bamboo, where a smaller shoot had forked out from it. I shot the female as she flew off and sat on a neighbouring tree.

"The egg is pure white and slightly glossy, measuring 1·8 inch by 1·32.

"On the 17th February, 1877, I found four nests of this Pigeon at Cheoukhon, a small village about three miles from the south bank of the Wimjeo river in Tenasserim.

"They were all placed in the forks of small trees from 12 to 20 feet above the ground, and were of the usual Pigeon type, mere platforms of twigs without a semblance of lining. Three out of the four contained one young one each; the fourth a pure white cylindrical egg, very slightly set, and measuring 1·77 by 1·26."

From Ceylon, Colonel Legge writes of this species:—"I am not aware that its nest has been taken by any naturalist in Ceylon; but I am able to state that it breeds in April and May in the south of the island, as I shot a female on the 28th of the former month at Baddegama, in the oviduct of which was an egg almost ready for expulsion."

Carpophaga insularis, Blyth. *The Nicobar Imperial Pigeon.*

Carpophaga insularis, Blyth, *Hume, Rough Draft N. & E. no.*
780ter. ¶

Mr. Davison remarks of this species that "they breed in February and March. On the 17th February I found a nest on the Island of Trinkut. It was built in a coconut palm, and was about 20 feet from the ground. As usual with Pigeons and Doves, it was simply a platform of dry twigs very loosely put together, and was built on a dried-up fruit-branch, which was itself merely a mass of dry twigs. It contained one large white egg. It is my

belief that the normal number of eggs laid by this Pigeon is only one. This certainly is the case with *Calenas nicobarica*, for I must have examined at least a couple of dozen nests, and in no single case was there more than one egg or one young one; and I have found that one egg was the usual number laid by *Palumbus elphinstonii*, and I was informed by several convicts that they usually obtain only one young one from the nests of the present species and those of *O. bicolor*."

The egg which Mr. Davison obtained is pure white, a very regular, moderately broad oval; the shell smooth and satiny, but with very little gloss. It measures 1.9 by 1.39.

***Carpophaga insignis* (Hodgs.).** *The Bronze-backed Imperial Pigeon.*

Carpophaga insignis (Hodgs.), *Jerd. B. Ind.* ii, p. 457; *Hume, Rough Draft N. & E.* no. 781.

According to Mr. Hodgson this species breeds in the central region of Nepal, building a large straggling nest of thin sticks placed on some horizontal fork, and laying from May to July a single pure-white egg, one of which is figured as measuring 1.75 by 1.27.

An egg of this species procured in Sikhim on the 14th July is a broad, very regular oval. The texture of the shell is fine and smooth, but there is not much gloss on the egg. It measures 1.72 by 1.28.

***Carpophaga cuprea*, Jerd.** *Jerdon's Imperial Pigeon.*

Carpophaga cuprea, *Jerd., Hume, Cat.* no. 781 bis.

Mr. F. W. Bourdillon writes from Southern Travancore:—"On the 9th of April my brother and myself happened to be passing through some very dense iral-jungle (*Besha travancorica*) at an elevation of about 4000 feet, when one of these Pigeons (*Carpophaga cuprea*) flew off her nest. The nest consisted of a very rough platform of garcinia-twigs loosely put together in a tangled mass of iral at about 20 feet from the ground. It contained a single, rather round, glossy, purely white egg, which was very hard-set."

Mr. Iver Macpherson remarks:—"This bird breeds freely in the forests of Mysore bordering the Wynaad, and, as a rule, their nests are not far from rivers or streams.

"I have taken nests on the following dates, all in the above forests:—

"1878, May 14th.	Fresh egg.
1880, March 21st.	Egg newly laid.
" April 27th.	Egg hard-set.
" " 29th.	Egg fresh.

"The nests, which are of a very insignificant character, consist of a collection of little sticks, and are exceedingly small for the size of the bird. The nests were always in small trees, and never at any great height from the ground, 15 feet being the highest and 10 feet the lowest that I have found them at. In every instance one egg only was laid."

The eggs are broad regular ovals, sometimes, however, a little elongated and slightly pointed towards one end; they are of course pure white in colour, and exhibit a faint gloss. Three eggs measure 1.68, 1.73, and 1.76 in length, by 1.32, 1.26, and 1.29 respectively in breadth.

Carpophaga griseicapilla (Wald.). *The Grey-headed Imperial Pigeon.*

Carpophaga griseicapilla (Wald.), *Hume, Cat. no. 781 ter.*

Mr. W. Davison writes from Tenasserim:—

"While ascending the north-west slope of Mooleyit on the 27th of January I flushed a Pigeon (which I shot) off her nest in a small sapling growing close to the path, but in very heavy virgin forest. The nest was the usual Pigeon-type of nest, a mere apology, of a few dry twigs loosely put together. There was only one egg fresh, but the female, on dissection, showed no signs of being about to lay another, so it is probable that one egg only is laid by this species. This egg is of course pure white and glossy, nearly the same thickness at both ends, but a little pointed towards the smaller end. It measures 1.61 in length by 1.15 in width."

Carpophaga bicolor (Scop.). *The Pied Imperial Pigeon.*

Carpophaga bicolor (Scop.), *Hume, Rough Draft N. & E. no. 781 quat.*

Captain Wimberley, to whom I owe the single egg of the Pied Imperial Pigeon that I possess, remarks:—"I obtained this egg on Trinkut Island (Nicobars) during the first week of February. The nest was built of sticks and twigs, and was very similar to that of our English Wood-Pigeon. There was only one egg in the nest, and it was much addled. The nest was placed in a low mangrove-tree overhanging the river, and the old bird flew off the nest as I drew near to it, but I failed to shoot it."

The egg is of a longish oval shape, a good deal pointed towards the small end, pure white, and tolerably glossy. It measures 1.76 by 1.25.

Mr. Davison remarks:—"Although I did not obtain the nest or eggs of this bird myself at the Nicobars, from all I could ascertain from the convicts, &c., these birds breed in January, February, and March, building their nests, which, like those of other Pigeons, are merely a platform of sticks, by preference in the mangroves, and laying usually only one white egg. I observed it on the Great Cocos, but did not meet with it at the Andamans."

Subfamily TRERONINÆ.

Treron nepalensis (Hodgs.). *The Thick-billed Green Pigeon.*

Treron nipalensis (Hodgs.), *Jerd. B. Ind.* ii, p. 445; *Hume, Cat.* no. 771.

Major C. T. Bingham writes from Tenasserim:—"Not a rare bird in the Thoungyeen, but less common than *Osmotreron phayriti*.

"I found several nests of this bird, which breeds in the Thoungyeen forests, throughout the end of February and the whole of March. My first four nests were all found in one day, and all were little platforms of straw on horizontally-growing bamboos, containing each a couple of unfledged young. This was on the 3rd March. Again on the 22nd March I got a nest similarly placed, with two eggs so hard-set that I failed to save them.

"The only other egg I got was on the 28th March, near Yok village in the Meplay district. It was placed in the usual flimsy nest in the fork of a small tree about 10 feet above the ground, and was pure white in colour and perfectly fresh. I procured the female to make certain."

The only egg of this species that I have seen, sent me by Major Bingham, seemed rather small for the size of the bird. It was of the usual Green-Pigeon-type, with a tendency to be pointed at both ends, pure white in colour, and moderately glossy. It measures 1.13 by 0.89.

Crocopus phœnicopterus (Lath.). *The Bengal Green Pigeon.*

Crocopus phœnicopterus (Lath.), *Jerd. B. Ind.* ii, p. 447; *Hume, Rough Draft N. & E.* no. 772.

The Bengal Green Pigeon, though found as a straggler in the eastern portions of the Punjab and Rajpootana, and somewhat more commonly almost throughout the Central and North-western Provinces and Oudh, is really *at home* only in Bengal and the tongue of Bengal-like country that runs up under the Himalayas westward to the Jumna; everywhere else the so-called southern species, *C. chlorigaster*, is much more abundant.

Following, I suppose, Dr. Jerdon, Mr. Wallace, in his article on the Pigeons of the Malay Archipelago, gives *C. phœnicopterus* from Northern India and China, and *C. chlorigaster* from Ceylon and the Indian Peninsula. As a matter of fact, *C. chlorigaster* is fully as common in Upper India, and in most places far more common than *C. phœnicopterus*. In the North-west Provinces both species associate in the same flock, *C. chlorigaster* being, as far as my experience goes, most numerous. Out of sixty odd shot in three days in the Etawah District in March 1866 only nine belonged to the so-called Northern Indian type, and seven shot near Hansi (Punjab) in December 1867 were all *C. chlorigaster*. Eastwards of

Bengal the present species shades into the nearly allied *C. viridifrons*, and throughout Upper India innumerable forms, more or less intermediate between it and *C. chlorigaster*, are to be met with. I have seen specimens of *C. phainopterus* from the Malabar coast; and though I have not yet thoroughly examined the question, I suspect that, different as are typical examples of the two races, they as little deserve specific separation as *Agithina tiphia* and *A. zeylonica*.

The present race or species breeds from March to June.

I have only myself found two of its nests, both in the Etawah district (where I have taken at least a dozen of those of *C. chlorigaster*), both placed near the outside of large mango-trees, at heights of from twenty to thirty feet from the ground, and in the vicinity of water.

The nests were slight twig-structures, laid upon two or three thin branchlets, forming a horizontal fork, devoid of lining, and perhaps 6 inches in diameter and 1 inch in thickness, with a shallow central depression barely $\frac{1}{2}$ inch in depth. Two is, I believe, the full complement of the eggs. This species is very common in the Dhoon and in the Kumaon Terai, but it remains there all the year through and does not ascend the hills.

From Seetapore Captain Cock remarked:—"Makes a rough stick-nest, rather high up, usually in a mango-tree. The nest is of the usual type, but frequently placed on an excrescence, or where some parasitic plant shoots out and thickens the foliage, so as to render the bird more difficult to be seen. Lays two white eggs of the usual type in May."

Colonel G. F. L. Marshall writes:—"I have found *C. phainopterus* breeding in the Mozuffernugger District in the winter (?); but in Saharunpoor it breeds in May and June, building on trees a small rude nest of twigs laid crosswise about twenty feet from the ground. It lays two white eggs of a rather broad oval shape. I found a nest with one fresh egg on the 16th May, and another with two fresh eggs on the 12th June. The old bird sat very close on both occasions, not stirring from the nest till I was close up to her, and then only moving out of reach and not leaving the tree. One nest was in a shishum and the other in a mulberry-tree, both on the canal-bank."

Subsequently Colonel Marshall wrote:—"The notice under my authority that this bird was found breeding in Mozuffurnugger in the winter is a mistake; whether I (or the printers) am responsible for it I do not know."

Colonel McMaster, writing both of this species and of *C. chlorigaster*, says:—"Green Pigeons are now (April and May) breeding at Chicalda. The nest is apparently very carelessly constructed of a few dead twigs placed haphazard at the end of a branch, but from this cause it is exceedingly well concealed, as the bough selected always appears to be a bare one, on which the dry twigs do not attract attention."

The eggs are of the usual Pigeon type, white and glossy, as a

rule broad, nearly perfect, ovals, but occasionally in this and other species of Green Pigeons a good deal pointed at one end.

In length they vary from 1·16 to 1·35, and in breadth from 0·9 to 1·0; but the average of eighteen eggs is 1·23 by 0·95.

Crocopus chlorigaster* (Blyth). *The Southern Green Pigeon.

Crocopus chlorigaster (Bl.), *Jerd. B. Ind.* ii, p. 448; *Hume, Rough Draft N. & E.* no. 773.

The Southern Green Pigeon breeds, I believe, throughout India, except in Lower Bengal, Sindh, and the western portions of Rajpootana and the Punjab. Throughout Continental India (I have no notes of the breeding-season in the Peninsula) it lays from March to June, making a typical Dove-nest on trees and laying the inevitable two white eggs. It has certainly two broods, perhaps more.

I have taken its nest in Etawah, Bareilly, Oonao (Oudh), Futtehghurh, and Meerut, and have had its eggs sent me from Hansie, Sealkote, and Mundlah (Central Provinces).

I have failed to notice anything worthy of record about its nidification. I have a score of notes like the following, one of which will suffice as a sample:—

“Etawah, March 23rd, 1867.—Two eggs. The nest was a loose structure of twigs, much like a common Pigeon’s or a Dove’s, at the fork, formed by six branches, of a mango-tree. The bird sat so close that it would not move for stones, &c., and only flew when a man climbing got close to the nest, and yet the eggs were nearly fresh.”

Mr. W. Blewitt found a number of this bird’s nests in the months of April and May in the neighbourhood of Hansie. As he secured and forwarded to me the parent birds, there can be no doubt as to the species. He says:—“The nests were placed on toon, neem, shishum, and keeker-trees, mostly growing on the canal-bank, at heights of from fourteen to eighteen feet from the ground.

“They were composed of shishum, *Zizyphus*, and keeker-twigs, in some cases slenderly, and in others somewhat densely, put together.

“One or two were absolutely without lining, but they were mostly very scantily lined with leaves, feathers, or fine straw. They varied from 5 to 7 inches in diameter, and from 1½ to 3 inches in depth. They contained two eggs in every case, and some taken at the end of May were quite fresh.” I have never found any lining that I can remember.

Colonel G. F. L. Marshall writes:—“I have taken the eggs of both these Green Pigeons in the Bolundshuhar District on the 8th and 16th May; both nests were in shishum-trees. I have also taken eggs of the present species on the 12th June. The nest is a few sticks placed about ten or twelve feet from the ground. The

bird sits exceedingly close, even when the eggs are fresh. The eggs are pure white and, as usual, two in number. I have pelted a bird with clods of earth for some time without getting it off the nest."

Lieut. H. E. Barnes writes from Rajpootana:—"I found the Southern Green Pigeon breeding in March."

Mr. R. M. Adam says:—"I found a nest of this species, containing one egg, in North Behar on the 27th March."

"In Agra I had the eggs of this species (with the bird) brought to me on the 2nd June, and about the middle of June I found a nest near Muttra, which contained two eggs. This nest was situated on a mango-tree in a small mango tope. It was a loosely made stick-structure placed on a fork."

Messrs. Davidson and Wenden, writing of the Deccan, say:—"Observed, but rarely, about Sholapoor. Commonest at Lanoli and Egulpoora. Nests taken on the Satara Hills, where it is common, in March. Observed at Nulwar."

Colonel Butler writes:—"Mr. J. Davidson sent me two eggs taken at Akrani, Khandesh, on the 15th and 17th April, 1881, respectively."

The eggs do not differ, I think, perceptibly from those of the preceding species, as in the whole of this family they are pure white and more or less highly glossed—are typically a moderately broad and very perfect oval, but are not unfrequently a good deal pointed towards one end. Like most of the Pigeons and Doves, they vary a good deal in size, viz. in length from 1.12 to 1.35, and in breadth from 0.9 to 1.0. The average of twenty-six eggs is 1.25 by 0.95.

Crocopus viridifrons (Blyth). *The Yellow-fronted Green Pigeon.*

Crocopus viridifrons (Blyth), *Hume, Cat. no. 773 bis.*

Mr. Oates writes from Pegu:—"One egg was brought in by my collector with the female bird. It was found in April, and there were two eggs. The nest was reported to have been placed in a bamboo, at a good height up one of the branches. Size of egg brought in 1.11 by 0.89; white with little gloss."

Major C. T. Bingham remarks of this Pigeon in Tenasserim:—"I have only come across this fine Green Pigeon in the Thoungyeen valley. It is not uncommon on the banks of the Meplay, where I found a nest as detailed below."

"At the place where the Hteechara chounng flows into the Meplay stands a grand old *Ficus* tree, which in March is loaded with fruit and the resort of Hornbills, Pigeons, Barbets, and innumerable other birds. On the 16th of the above month I found in a small *sisyphus* tree (*Zizyphus jujuba*), growing about twenty yards from the *Ficus*, a nest of this Pigeon containing two pure white eggs slightly set. The nest was the usual careless few twigs laid

across and across, and was not more than twelve feet from the ground. I shot the female as she flew off. The eggs measured 1·23 inch by 0·90 and 1·22 by 0·81."

The eggs of this species are not separable from those of its Indian congeners. They are ovals with a tendency to point at both ends, pure white, and with a faint gloss.

Osmotreron bicincta (Jerd.). *The Orange-breasted Green Pigeon.*

Osmotreron bicincta (Jerd.), *Jerd. B. Ind.* ii, p. 449; *Hume, Rough Draft N. & E.* no. 774.

Some twenty years ago Mr. Blyth recorded the following note about the Orange-breasted Green Pigeon and its nidification:—

"This beautiful species is common to all India, but would seem to be more numerous in Lower Bengal than in the Peninsula; and it occurs plentifully in Nepal, Assam, Sylhet, Tipperah, Arracan, and the Tenasserim Provinces. In Bengal, however, it is much less numerous than *Treron phænicoptera*, and the flocks of the two species do not commingle. I once found its nest, halfway up a small mahogany tree, in the Calcutta Botanical Gardens. The eggs, of somewhat less lengthened form than in Pigeons generally, measured 1½ inch in the long diameter. I have also obtained the young, which resemble in colouring the adult female."

Following Blyth, but perhaps scarcely understanding what the latter really meant, Dr. Jerdon tells us that this species is spread throughout the greater part of India, &c.; but, as a matter of fact, it is entirely unknown in Khandesh, Goojerat, Kattywar, Sindh, the Punjab, Rajpootana, and the North-west Provinces, and is only known in the sub-Himalayan terais of Behar and Oudh and the eastern forest-regions of the Central Provinces. It is a purely Indo-Burmese type, not to be found, I think, in India out of the 60-inches rainfall regions, and, excluding Assam, Cachar, &c., is not, I believe, to be found over more than one third of India proper.

According to Mr. Hodgson, this species breeds from April to June in the terai and the low valleys at the base of the Nepal hills. They make a loose stick-nest on branches of trees, at no great elevation from the ground, and lay two pure-white eggs, the usual Pigeon-shape, one of which is figured as measuring 1·15 by 0·8.

I know little of its nidification. Mr. Irwin took a nest in Hill Tipperah in April, containing two eggs, which he kindly sent me. He described the nest as a very slight structure, of thin twigs loosely put together and laid towards the end of a branch of a small tree.

The eggs, to judge from those sent, are very perfect ovals, pure white, moderately glossy, and about the size of those of *Turtur*

senegalensis. The only eggs that I as yet possess of this species are those taken by Mr. Irwin.

These measure 1.1 by 0.9 and 1.02 by 0.85. I must say that I doubt the eggs of this small bird ever being 1.25 in length; but eggs were not measured accurately with calipers in 1845, when Blyth wrote.

Mr. Oates, writing from Pegu, remarks:—"Nest with two hard-set eggs in a thick bush about 7 feet from the ground. White with a little gloss; 1.06 and 1.09 by 0.87. The nest was merely a few sticks laid together like a dove's. This Pigeon breeds in Pegu from March to May."

Osmotreron vernans (Linn.). *The Pink-necked Green Pigeon*.

Osmotreron vernans (Linn.), *Hume*, *Cat.* no. 774 bis.

Mr. Davison, writing from Southern Tenasserim, says:—"On the 12th of January (1880) I found a nest of this Pigeon, in a small, very dense thorny bush. The nest was of the usual pigeon and dove type, consisting merely of a few dry twigs. It was placed about 5 feet from the ground."

These eggs measure 1.15 in length by 0.81 and 0.82 respectively in breadth.

Two other eggs found at Kussom in the Malay peninsula on the 7th July measure 1.11 and 1.05 in length by 0.86 and 0.85 respectively in breadth.

The eggs are ovals, varying from moderately broad to considerably elongated ones, always apparently obtuse at one end, often at both. They are pure white and have little gloss.

Osmotreron malabarica, Jerd. *The Grey-fronted Green Pigeon*.

Osmotreron malabarica, Jerd., *Jerd. B. Ind.* ii, p. 450; *Hume*, *Rough Draft N. & E.* no. 775.

The Grey-fronted or Malabar Green Pigeon is peculiar to the wooded and more or less hilly tracts of the Indian Peninsula. It appears to breed from February to April, making the usual slight stick-nest upon trees and laying two eggs.

I have never taken the eggs myself. Mr. J. Darling, jun., writes to me that he "took several nests of this species on the 10th April, at an elevation of about 3000 feet, at the foot of the Terriat Hills, ten miles north-west of Vythery, South Wynaad. The nests were placed in 'Nelly-kai' (the so-called gooseberry) trees, at heights of from 14 to 16 feet from the ground, in forks, and one of them in a bamboo, all situated in scrubby jungle with only a few scattered trees. There were numbers of old nests apparently of this same species all close together. The nest was a slight, ragged, shapeless thing, composed of thin, dry twigs, laid together in a very disreputable fashion, with a circular central depression lined with a few

grass-stalks. The nests were 5 or 6 inches in diameter; the depression hardly more than $\frac{1}{2}$ inch in depth. The eggs, two in number, were both a good deal incubated. They are pure white, and measured about 1.12 by 0.87. On one nest I shot the female, on another the male with its beautiful maroon mantle."

One egg sent me by Mr. Darling measured 1.08 by 0.84.

Mr. F. W. Bourdillon kindly favoured me with an egg of the Malabar Green Pigeon, which he procured in the Assamboo Hills on the 24th February. The egg was a little set, and was placed on a very slight nest of twigs some six inches in diameter. The nest was built upon a bough, at a height of some 40 feet from the ground.

For the size of this bird the egg seems small; it only measures 1.02 by 0.87; it is therefore a very broad oval, but it is very slightly pointed towards one end. The shell is fine and compact, but thickly studded with minute pores, and has but little gloss. It is of course pure white.

Another egg subsequently sent to me measured 1.11 by 0.85.

Osmotreron phayrii, Blyth. *Phayr's Green Pigeon*.

Osmotreron phayrii, Bl., *Jerd. B. Ind.* ii, p. 451; *Hume, Cat.* no. 776.

Mr. J. Darling, junior, writes:—"March 19th. Took a nest of *Osmotreron phayrii*, with one fledged young one, and one had egg. It was built in a tree 18 feet from ground, on a small hill covered with bamboo jungle. It was the ordinary disreputable platform of twigs, of about 6 inches in diameter, and the central depression had to be well looked at before it could be discerned. This nest was found on a small range of hills about 3 miles east of Tavoy, at an elevation of some 600 feet."

The eggs seem as a body* to be rather elongated ovals, though here and there a fairly broad one occurs, and are often a good deal pointed at the small end. They are of course pure white and have a fine gloss, in some specimens almost equal to that of *Merops* and *Coracias*.

Osmotreron chloroptera (Blyth). *The Andaman Green Pigeon*.

Osmotreron chloroptera (Bl.), *Hume, Rough Draft N. & E.* no. 777 bis.

The Andaman Green Pigeon probably breeds in May and June. Early in May Davison saw one carrying a twig to the top of a slender tree standing on the outskirts of the forest near Port Blair, where it was apparently building its nest.

* Mr. Hume appears to have received several eggs of this species from his correspondents, but I cannot find any notes regarding the discovery of these eggs.—Ed.

Sphenocercus sphenurus (Vigors). *The Wedge-tailed Green Pigeon.*

Sphenocercus sphenurus (Vig.), *Jour. B. Ind.* i, p. 453; *Hume, Rough Draft N. & E.* no. 778.

The Wedge-tailed Green Pigeon or Kokla breeds throughout the outer ranges of the Himalayas south of the first Snowy Range, at elevations of from 4000 to 7000 feet. To the Himalayas west of the Ganges they are merely summer visitants, and this may also be the case in Kumaon, Nepal, and Sikhim, though I have not as yet positively verified the fact. West of the Ganges they arrive early in April, and by November have all disappeared, not to the low valleys of these same hills, not to the plains that lie below them, but elsewhere.

Long ago Captain Hutton wrote to me:—"What becomes of the Kokla, which, arriving in early summer, retires again in small parties as the autumn sets in? Where do they then go to? Within the mountains of the North-west not one remains, neither are they to be found in winter in the warmer region of the Dehra Dhoon, although the Hurrial (*Treron phænicoptera*) still remains there. Leaving us, as it does, as soon as the summer heats decrease, it evidently seeks a warmer climate, where the fruits and berries upon which it feeds are procurable, till spring returns, and it seems therefore by no means improbable that they may select the Eastern isles. But have they ever yet been found there? Blyth, in his 'Catalogue of Birds,' merely assigns the 'Himalaya' as their habitat, which is obviously incorrect, as it is merely a summer visitor to the hills, and we consequently still require to know where it resides at other seasons."

In 'Lahore to Yarkand' (p. 119) I drew attention to the remarkable fact that "vast multitudes of a large and conspicuous species, tenanted during the summer a zone of hills varying from twenty to one hundred miles in width, and stretching at any rate from the borders of Afghanistan to the banks of the Ganges at Hurdwar, absolutely desert us during the winter, and no one has yet explained what becomes of them." We know that they neither went north, south, nor west, and hence I concluded that they must go eastwards, and recent inquiries that I have made, and collections that I have examined, lead me to the conclusion that a great proportion of these Koklas migrate to Assam, Cachar, Tipperah, Burma, and even the northern portions of Tenasserim, in all hilly and forest-clad localities, in which they appear to be common during the winter, and either rare or wanting during the summer.

In the Himalayas they breed from April to July (most commonly at an elevation of 5000 feet), making a slight platform-nest composed of coarse grass and small dry twigs, loosely laid on some

forked branch at any height from 6 to 50 feet above the ground.

They lay two eggs. Whether they breed during the cold season when absent from the hills I cannot say. In the Himalayas, so far as I have yet been able to ascertain, they have only one brood.

Colonel C. H. T. Marshall writes:—"The Kokla breeds in spruce-firs about Murree. The nest is usually about 20 feet up, built by the trunk of the tree. It lays in June."

Captain Hutton says:—"This species, which is the Kokla of the natives, arrives in the neighbourhood of Mussoorie in the beginning of April, and remains during the summer to breed.

"The nest is composed of dry twigs, and the eggs, two in number, are usually pure white and more gracefully ovate than those of *Turtur risorius*, and measure about 1.12 by 0.82. The breeding-season lasts from the end of April until the latter end of June, and the nest is a slight platform usually placed on high forest-trees. In October they collect into small flocks of six or eight and quit the neighbourhood of Mussoorie."

From Kumaon Mr. R. Thompson remarks:—"Their nests are composed of small dry twigs loosely laid in the forked branches of a tree, not unusually at no great height from the ground. They lay two pure white eggs. They breed from April to June, and are most plentiful at heights varying from 4000 to 5000 feet. The fruit of the *Myrica sapinda*, or kaiphal, which ripens about their breeding-time, affords food for vast numbers of these birds."

Mr. Hodgson tells us that this species breeds in the central region of Nepal from April to July, laying two pure white eggs, one of which he figures as measuring 1.12 by 0.85.

The eggs that I possess of this species, taken in the neighbourhood of Simla, Gurhwal, and Mussoorie, strongly resemble those of *Crocopus*; but they are, if anything, somewhat narrower and more elongated ovals. They have also, perhaps, a trifle less gloss. They are, of course, pure spotless white. In length they vary from 1.05 to 1.26, and in breadth from 0.8 to 0.95; but the average of fourteen eggs is 1.18 by 0.89.

Order CUCULI*

Family CUCULIDÆ.

Subfamily CUCULINÆ.

Cuculus canorus, Linn. *The European Cuckoo*.

Cuculus canorus, Linn., *Jerd. B. Ind.* i, p. 322; *Hume, Rough Draft* N. & E. no. 189.

The Common Cuckoo breeds with us, so far as I know, only in the Himalayas, though Mr. F. R. Blewitt is of opinion that it must breed occasionally in the hilly forest-tracts of the Central Provinces, as he has met with it there during every month of the year.

It lays during the latter half of May and the first half of June, selecting the nests of Pipits (*Oreocorys sylvanus* and *Anthus jerdoni*), Stonechats (*Pratincola maura*, *O. ferrea*, and *P. caprata*), *Copsychus saularis*, and doubtless many other species.

The late Captain Cock wrote to me that this species is "very common at Dhurmsala during May; it usually makes its appearance in April, and, I fancy, as soon as it has finished laying departs. The nest of *Pratincola caprata* is the one that is generally selected to lay the egg in, although on one occasion I found a young one in a nest of a *Malacocercus*. I have taken four eggs at different times from the nests of *P. caprata*. I was for a long time uncertain what Cuckoo the eggs belonged to, till I found a young Cuckoo and three addled eggs belonging to *P. caprata* in the same nest, and I watched the old cock and hen *Pratincola* feeding the young one, which was an undoubted *C. canorus*. It is remarkable that the nest of *P. caprata* should be selected, as it generally builds on a bank or under a stone, always on the ground; and although some eggs of *C. canorus* are somewhat like some of *P. caprata*, yet there is a great difference in the size, and one would think that the female Cuckoo would have some difficulty in getting into the small hole in which the nest is generally placed. But the *Malacocerci* are not common up here at all, and I could not be quite sure that the young Cuckoo I found in the *Malacocercus*' nest was *C. canorus*, though it most probably was. I believe the *Malacocerci* usually

* I am indebted to Captain G. E. Shelley, who is now writing a Catalogue of the Cuculi in the British Museum, for the correct names of some of the Cuckoos.

have the credit of bringing up the young Cuckoos. On one occasion I found a Cuckoo's egg in the nest of *Lanius erythronotus*; but this was not the egg of *C. canorus*, and I have always thought it must be the egg of *C. himalayensis*, as it is a slightly smaller egg than that of *C. canorus*. Eggs always found in May; last egg taken on 29th May, 1869. Found a young fledged Cuckoo on 30th May, 1869."

I myself see no difficulty about getting the eggs into the nest. Only two years ago I shot a female Cuckoo with an egg in her mouth, and though the egg was smashed I have seen enough Cuckoo's eggs since then to be pretty sure it was her own egg; and I fully believe, though it seems to be considered fabulous at home, that the Cuckoo does at times carry her egg in her mouth after laying it. Again, I have taken an egg of *Coccyzus jacobinus* out of a domed nest of *Munia malabarica*, into which the parent bird could, at most, have only got her head and neck.

Mr. Brooks says:—"Common all over the district around Almorah where the country is open. I have one egg taken from a nest of *Pratincola maura* at Almorah, another from a nest of *Copsychus saularis*. They lay in Kumaon in May."

I myself obtained two specimens in nests of *Oreocorys sylvanus* on the 9th and 11th June, near Kotegurh.

Colonel C. H. T. Marshall, writing from Murree, tells us:—"We found the eggs of this bird in the nests of *Oreicola ferrea* and *Anthus jerdoni*."

Mr. R. Thompson says:—"Lays in May and June. I found one or two young birds in the nests of Pipits at Almorah some years ago. In July the birds are well on the wing, and betake themselves to lofty trees, and begin their migrations south forthwith."

Dr. Scully writes:—"The Common Cuckoo is found in great numbers in the Valley of Nepal during six months of the year, from April to October. The earliest date on which it was noticed was the 31st March, and the latest about the first week in October. It frequents the central woods and the forests on the hill-sides up to 6000 feet, rarely ascending to about 7000 feet. It lays in May and June, generally selecting the nests of *Pratincola maura* and *O. ferrea*, and occasionally, I think, that of *Pomatorhinus erythrogenys*."

Colonel Butler remarks:—"I believe that the Common Cuckoo breeds at Mount Aboo (although I have never taken the eggs there) from the following observations. At the end of May it arrives in considerable numbers. At that season they are remarkably noisy, enlivening every part of the hill with their familiar note, for about six weeks or two months, after which they are silent.

"I noticed particularly that all of the birds on their arrival were in the adult plumage.

"About the beginning of October a number of young birds in the hepatic plumage made their appearance, and these had only

recently left the nest, so that probably these were hatched on the hill."

The two eggs sent me by Captain Cock as belonging to the Common Cuckoo are in shape somewhat elongated ovals, slightly compressed towards one end. In texture the shell is fine and compact, but with scarcely any gloss. The ground-colour is nearly pure white, and the egg is finely spotted and delicately streaked and speckled with a somewhat pale yellowish brown and faint purple, the markings being pretty thick towards the large end, but somewhat sparse over the rest of the egg. An egg obtained by Captain Blair at Kotegurh is precisely similar, but has the ground-colour faintly tinged with pink.

The eggs vary, as is well known, to a remarkable extent, both in size and colouring. Of two others which I myself obtained I have noted:—"Of one the ground is pure white and glossless, thinly freckled and streaked with brownish red and pale purple. The other has a pinkish, stone-coloured, somewhat glossy ground, mottled and freckled with dull, slightly brownish red."

In length the eggs vary from 0·93 to 1 inch, and in breadth from 0·7 to 0·73 inch.

Cuculus intermedius, Vahl. *The Asiatic Cuckoo*.

Cuculus himalayanus, Vig., *Jerd. B. Ind.* i, p. 323.

Cuculus striatus, *Drap., Hume, Rough Draft N. & E.* no. 200.

This species, the Asiatic Cuckoo, lays during June, and only I believe in the Himalayas within our limits, though its wanderings are extended far and wide, and I have myself quite recently shot it in the southern group of the Nicobars.

I have never taken the eggs, but have obtained the young in company with *Trochalopteryx lineatum*, the species that most commonly officiates as foster-parents for this Cuckoo.

Writing from Mussoorie, Captain Hutton says:—"The natives have an idea that this bird builds its own nest and rears its young itself: this is erroneous, but it evidently arises from the curious fact that, when the young bird is old enough to leave the nest, the foster-parents feed it no longer, and it is then supplied by the old Cuckoo, or at all events by one of the same species. This I have myself repeatedly witnessed, and think it not improbable that others of the Cuckoo tribe may do the same thing, for it seems almost incredible that *Trochalopteryx lineatum*, in whose nest the egg of *C. intermedius* is often dropped, could supply so voracious a bird after it had left the nest, neither could the little Hedge-Sparrows of England do so for the young of *Cuculus canorus*. At Jeripancee, below Mussoorie, I have seen the young Cuckoo sitting for hours together on a branch waiting for the return of the adult bird, which continued every now and then to bring supplies of caterpillars wherewith to satisfy the apparently insatiable appetite of the nestling, until at last both would fly off to another spot. To

satisfy myself that it was really this Cuckoo that fed the young, I shot one in the very act, and found it to be no other than our summer visitant, *Cuculus intermedius*."

One egg taken out of a female bird of this species (which he shot at Buttun Pir, Cashmir, on the 17th June) by Mr. Brooks is a very perfect elongated oval, a shade narrower at one end. The ground-colour is pure white, with a slight gloss. The markings, which are everywhere very sparse, are somewhat most numerous towards the larger end, and consist of minute specks and tiny lines, not more than 0.05 inch in length, of dingy olive-brown and very pale inky purple or purplish grey.

The egg measures 0.89 by 0.6 inch.

***Cuculus poliocephalus*, Lath. *The Grey-headed Cuckoo*.**

Cuculus poliocephalus, Lath., *Jerd. B. Ind. i*, p. 324; *Hume, Rough Draft N. & E. no. 201*.

Nothing certain is known of the eggs of this species, the Grey-headed Cuckoo. Mr. R. Thompson says it lays in May and June, and that he has killed old and young birds together in June.

An egg believed to belong to this species was taken by Mr. Brooks out of a nest of *Phylloscopus humii* at Goolmerg, Cashmere, on the 2nd of June. It is an elongated, cylindrically ovate egg, nearly the same size at both ends, which are both obtuse; pure white and glossy. The nest contained three of the eggs of *P. humii*, which are only about half the size of this egg, almost glossless, and richly spotted with red.

The egg measures 0.81 by 0.57 inch.

***Cuculus sonnerati*, Lath. *The Banded Bay Cuckoo*.**

Cuculus sonnerati, Lath., *Jerd. B. Ind. i*, p. 325; *Hume, Cat. no. 202*.

Eggs supposed to belong to this species, and found in the nest of *Otocorys fuscicaudata*, are moderately broad ovals, distinctly pointed towards the small end. The shell fine, smooth, and with a faint gloss. The ground-colour white or nearly so, with ever so slight a pinky tinge, and they are in some cases very thinly sprinkled, in others more profusely adorned with specks, spots, and irregular hieroglyphic-like marks of a rather dull brick-red, which has at times somewhat of a brownish tinge. They measured 0.88 and 0.51 in length, by 0.62 and 0.51 respectively in breadth.

Fragments of an egg-shell extracted from the nidus of a female of the Banded Bay Cuckoo, shot on the Nilgiris on the 18th May, 1874, are pale bluish green and quite spotless.

Hierococcyx varius (Vahl). *The Common Hawk-Cuckoo.*

Hierococcyx varius (Vahl), *Jerd. B. Ind.* i, p. 329; *Hume, Cat.* no. 205.

Mr. Iver Macpherson writes from Mysore:—"I send you an egg which I believe to be that of this bird.

"There can, I think, be no doubt that this Cuckoo selects the nests of *Crateropus griseus* and *C. canorus* to deposit its eggs in. In June 1878 I found a nest of the latter with one young bird almost fully fledged and nearly filling up the whole nest. It was certainly not a Babbler, and I don't know what other bird it could have been, if not this Cuckoo.

"Towards the end of last June Major McInroy, at Hünsür, found a nest of *C. griseus* with five hard-set eggs, which he left. On returning to it a few days after he found one young bird only in the nest. At intervals of a few days he paid two other visits to the nest, and was quite convinced in his mind that the solitary inmate of it was *H. varius*. Unfortunately he left for England before the bird was fully grown.

"The egg I send you was found in the nest of *Crateropus canorus*. The nest altogether contained five eggs; four of the usual size of those of *C. canorus*, the fifth was this large egg."

Mr. E. Aitken remarks:—"I later got an egg of *Hierococcyx varius*, also in a nest of *Argya malcolmi*, which had even a thicker shell than those of *C. jacobinus*, and a more highly coloured albumen. I see no mention of this bird in 'Nests and Eggs.' The egg I send you is an undoubted one. I compared it with one Bingham had which he took out of a *H. varius* he shot in his compound in the N. I. lines here, and it was at once recognized by Capt. Cock: it is very deep in colour."

The eggs are rather elongated, rather cylindrical ovals, very blunt at both ends. The shell is fine and glossy. The colour is a uniform, rather dark greenish blue. They are larger, more elongated, and darker coloured than those of *C. jacobinus*.

Another egg supposed to belong to this species is a moderately elongated oval, rather obtuse at both ends, highly glossy, and of a rather pale greenish blue.

Four eggs supposed to be of this species measure from 0.95 to 1.15 in length by 0.75 to 0.82 in breadth.

Hierococcyx niscolor (Hodgs.). *Hodgson's Hawk-Cuckoo.*

Hierococcyx niscolor * (*Hodgs.*), *Jerd. B. Ind.* i, p. 330; *Hume, Cat.* no. 206.

* There are three closely allied species of *Hierococcyx* which occur in South-eastern Asia. *H. niscolor* of Hodgson, from Nepal and Sikkim down to Singapore, has a small bill, sharp wing, and very rufous lower plumage. *H. fuscus* of Horsfield, from Malacca, Singapore, Sumatra, Java, and Borneo, has a huge bill, a blunt wing, and white lower plumage. *H. hypoleucos* of Gould, found from Japan down to the Philippines, has a small bill, blunt wing, and uniform rufous breast, contrasting with the white abdomen. The above comparisons are drawn, of course, from fully adult birds.—Ed.

An egg of this species, which was extracted from the oviduct of the female (so Mandelli told me distinctly) on the 5th June, is a broad oval, scarcely at all pointed towards the small end, and a little obtuse at the large end.

The colour is a uniform olive-brown, and round the large end there is an indistinct zone of a darker shade; the shell is firm and smooth, but there is very little gloss on the egg; it measures 0·89 by 0·64.

***Hierococcyx sparveriioides* (Vig.).** *The Large Hawk-Cuckoo.*

Hierococcyx sparveriioides (Vig.), *Jerd. B. Ind.* i, p. 331; *Hume, Rough Draft N. & E.* no. 207.

A single egg of the Large Hawk-Cuckoo, brought me from the Nilghiris by Mr. Davison, is a perfectly pure white, moderately glossy, and very like the eggs of *Coracias indica*; his authority was Mr. R. H. Morgan, of the Madras Forest Department, who averred that he had watched the bird build the nest and had then taken the eggs, of which four were laid. If there be no mistake about this egg, the fact that the Hawk-Cuckoos build their own nests is interesting.

The egg measures 1·39 by 1·05 inch.

Mr. Hodgson's MSS., however, tell a very different story; his notes are to the following effect:—"This species occurs both in the hills and plains; in March or April they arrive in the central hills, and remain till about August, when they begin to descend the hills, rarely more than a pair is seen together. They may very often be seen sitting on the naked branch of a tree darting at any passing insect, seizing it in their bills and returning to their perch to devour it. Sometimes they descend to the ground in search of insects, soon, however, returning to the branch. When the breeding season arrives in March and April, the pair may often be seen seated upon some high branch, repeating continually their loud call (*chuck dol-dol*) or again uttering a note like that of the Koël, or another cry which exactly resembles the cough of a human being. These varied cries are continually repeated not only during the day, but also during parts of the night, until the end of June or the early part of July. Then they steal and devour the eggs out of the nests of other birds, laying their own instead, which these other birds duly incubate; thus quite recently a *Trochalo-pterum nigrimentum* was observed feeding a bird of this species which must have been nearly a year old, and again we obtained another young one about two months old in the act of being fed by a male *Iapops nepalensis*."

Miss Cockburn has furnished me with the following very interesting note from the Nilghiris:—"On Saturday, April 11th, 1874, I sent two servants (good nest-finders) to a small swamp at an elevation of about 4000 feet, where there were a few pairs of White-breasted Water-hens (*Gallinula phasianina*), to seek for their eggs. Not finding any their attention was drawn to a clump

of trees at the edge of the swamp, from one of which a Hawk-Cuckoo flew out. On watching it they saw it return to the same spot, and on looking up into the tree there was a large nest, of mere sticks, resembling a Common Crow's nest, but with the Cuckoo *sitting in it*! One of the men immediately climbed up, and found three eggs in the nest. He descended again, and the other servant, who had a gun, fired at the bird and missed. The Cuckoo flew away, but returned after some time, to be fired at again. This shot being a long one it was again missed, and as it was then very late, one egg from the nest was brought away. Next day being Sunday nothing could be done. On Monday the 13th they started very early, and reached the place about half-past eight o'clock. The Cuckoo was still there, and was *shot*. Though the people were there for about three hours on Saturday, and an hour or two on Monday, they only saw this *one* bird. Is the work of nidification, which may be called 'a labour of love,' left to the female *entirely* by this species?

"The nest was placed between three upright branches, at the measured height of 27 feet from the ground; it was tied together and brought to me. Its dimensions are 21 inches in length, 15 in breadth, 8½ in depth. The hollow in the centre for the eggs is oval, 5 inches long, 3 broad, 1½ deep. The nest is almost entirely built of the same kind of twigs; two or three of them are thick, and have a little lichen sticking to them. Nothing like lining is added. The eggs were three in number, perfectly white, with a few touches of light brown on two of them; they were much incubated. The inner skin of these eggs has a greenish-blue colour.

"On May 21st, 1874, I went to see another nest of the large Hawk-Cuckoo, which had been discovered a few days previously. It was placed *along* several branches (which grew horizontally) of a very large tree, on the side of a steep hill, the ground stony and ploughed, and at about 4500 feet of elevation. The nest was more to one side of the tree than the centre, situated among thick foliage. A ladder had to be ascended to reach the nest; it contained no eggs or young, but a quantity of the droppings of the birds. It appeared to be a nest that had been used for several seasons, as there was a large accumulation of thin sticks, giving the idea of a few fresh ones having been added when the abode was required at the return of each breeding-season.

"I saw the birds near the tree, but they did not approach the nest while I was there. However, my servant said that he saw one of them *sitting on the nest* a few days before.

"I have no doubts as to the identity of this nest, as it was *exactly* like the one found a short time ago containing three eggs."

Cacomantis passerinus (Vahl). *The Indian Plaintive Cuckoo.*

Polyphasia nigra (Bl.), *Jerd. B. Ind. i.*, p. 383.

Ololygon passerinus (Vahl), *Hume, Rough Draft N. & E. no. 208*

Miss Cockburn, the only person, so far as I know, who has secured the eggs of the Indian Plaintive Cuckoo, gives me the following note on the subject (she writes, I may add, from the Nilghiris):—

"I have long been unable to find the eggs of this bird, and thought it most likely that it did not breed on these hills. At last, on the 17th September, 1870, the nest of a Common Wren-Warbler (*Prinia inornata*) was found, which had two small eggs, and a third which was much *larger*, but of something the *same colour*. A few hours after another Common Wren-Warbler's nest was found, which also contained two small eggs (one of which was *broken*) and a large egg. These two nests were not far from each other: I took them both. On the 22nd September another nest of the same Warbler was found, which also contained a large egg and two small ones.

"The same day, one of my servants, seeing a Plaintive Cuckoo sit very quietly on a hedge, shot it. On examination it was found to contain an egg *ready* to be laid, of the *same colour and spots* as those found in the Common Wren-Warbler's nest! The egg was unfortunately broken, but the pieces were sufficient to identify those found in the little Warblers' nests. On the 26th September a Common Wren-Warbler's nest was found, which had only a Cuckoo's egg in it. The Cuckoo was seen near the nest, and the little Warblers in a great fright (for the appearance and flight of the Plaintive Cuckoo very much resembles that of a small Hawk); on looking into the nest, there was the egg. It was left for two or three days, but on going to the spot again the nest was found to be deserted, so the Cuckoo's egg was brought away.

"On the 5th October, 1870, another Common Wren-Warbler's nest was found, but this time it was occupied by a *young* Plaintive Cuckoo, which entirely filled the wee nest, and had the boldness to pick at my finger every time I tried to touch it. The nest had no young Wren-Warblers. Whether the young Cuckoo had pushed the little Warblers out, or whether no other egg except the Cuckoo's was hatched, it is impossible to say. I regret not having seen the nest till at this stage of the young Cuckoo's existence. A week after it had left the nest, but was caught among the bushes close by. Considering the smallness of a Common Wren-Warbler's nest, and one of the Warbler's eggs having been found *broken* in one of the nests, as mentioned above, there can, I think, be little doubt but that this bird, like its European namesake, must carry her egg in her mouth and drop it into the nest.

"The mouth of the Plaintive Cuckoo always struck me as being uncommonly *large* for the size of the bird. When opened it is of a beautiful orange colour."

Mr. Adam remarks:—"Miss Cockburn's interesting note on the breeding of this species fully explains what I thought at the time to be a case of fraud on the part of some of our native fellow-subjects. Towards the end of September 1866, when in Lucknow, I had small boys collecting nests for me, and on two occasions nests

of *Prinia inornata* were brought to me containing an egg somewhat like that of *P. inornata*, but much larger, in fact exactly like that described and sent by Miss Cockburn. I accused the boys of having taken the eggs from some other nests, but they maintained that they had not done so. I did not believe them *then*, but I do *now*."

Mr. R. Thompson says:—"In the Dehra Doon I have found the young one in a nest of the *Pyctorhis sinensis*. On another occasion I found a young one in the nest of *Lanius erythronotus*. It is a common breeder in these parts, and breeds here in May and June."

Sometimes this species lays in the nest of *Molpastes bengalensis* as one was snared near Darjeeling on a nest of this Bulbul.

The eggs of this species (one of them, a broken one, taken from the oviduct of the female), which I owe to Miss Cockburn, of Kotagherry (Nilghiris), are elongated ovals, occasionally more or less cylindrical. The shell is very fine and smooth, and is fairly glossy. The ground-colour is a delicate pale, greenish blue, blotched and spotted boldly but sparsely, and almost exclusively towards the large end of the egg, with reddish or purplish brown and pale reddish purple. The markings seem generally to form a very imperfect and irregular, but still more or less conspicuous zone round the large end.

The eggs vary from 0.78 to 0.81 inch in length, and from 0.53 to 0.57 inch in width.

Chalcococcyx maculatus (Gm.). *The Emerald Cuckoo*.

Chrysococcyx hodgsoni, Moore, *Jerd. B. Ind.* i, p. 338.

Chrysococcyx maculatus (Gm.), *Hume, Cat.* no. 211.

On the 1st of June Mr. Mandelli obtained a nest of *Stachyrhiodopsis ruficeps* containing three fresh eggs of the usual type, and one very much larger of a nearly uniform pale pinkish chocolate.

On the 12th of July another nest of this same species was found at Lebong, which also contained three fresh eggs of the *Stachyrhiodopsis* and another similar reddish egg. It is quite certain to my mind that the egg is that of some Cuckoo, and in my opinion the only Cuckoo to which it can belong is *Chalcococcyx maculatus*. It might of course be the egg of *Cuculus sonnerati*, but it is, I think, too small, and differs too essentially from the *Cuculus* type. It is certainly not the egg of *Cacomantis passerinus*, the only other small Cuckoo that occurs in the neighbourhood of Lebong.

The egg is a very regular oval, scarcely, if at all, smaller at one end than the other. The shell, though small, has only a very faint gloss. The colour is most peculiar—a uniform pink with a certain chocolate tinge in it, and with, when closely examined, a few very minute, pale claret-coloured specks, scarcely darker than the ground, scattered about its surface.

It measures 0.8 by 0.62.

Coccytes jacobinus* (Bodd.). *The Crested Pied Cuckoo.*Coccytes melanoleucos* (Gm.), *Jerd. B. Ind.* i, p. 880.*Coccytes jacobinus* (Bodd.), *Hume, Rough Draft N. & E.* no. 212.

Our Indian Crested Pied Cuckoo lays, in the plains of India and the lower ranges of the Himalayas, during the latter half of June, July, and August. From Pind Dadun Khan to Tipperah, and from Dehra Doon to Salem, the season seems to be the same, but in the Nilghiris the various Babblers, in whose nests this species deposits its eggs, breed in January, February, and March, and there this Cuckoo also seems to lay in those months. Mr. R. Thompson writes:—"In Dehra Doon this species is very common, and lays in July and August in the nests of the *Crateropi*, whom I have constantly watched later in the year feeding the young of this species. I have seen it in Gurhwal during the breeding-season, but it is not common there."

Mr. W. Theobald makes the following note of this bird's breeding in the neighbourhood of Pind Dadun Khan and Katas in the Salt Range:—"Lay in August; eggs, one only; shape, blunt oval; size, 0.91 inch by 0.81 inch; colour, deep greenish blue. This evidently parasitical egg was taken from the nest of *Malacocercus caudatus* containing four ordinary eggs, which it closely resembles in colour, though its form indicates its parasitical character."

Mr. A. G. R. Theobald, writing from Aptoor, Salem District, says he took an egg out of the oviduct of a female on the 18th August.

The only species in whose nests I have myself known the eggs of this Cuckoo ever to occur, are *Argya malcolmi*, *Crateropus canorus*, *Argya caudata*, and *Argya earlii*, and by far the most frequently in those of the former.

From Kotagerry Miss Cockburn remarks:—"On the Nilghiris it appears to be exclusively in the nests of the large Grey Babbler (*A. malcolmi*) and of our Common Laughing-Thrush (*T. cachinnans*) that the Pied Crested Cuckoo deposits its two greenish-blue eggs."

As a rule, the young Cuckoo is the only bird that the foster-parents rear; numbers of times I have seen a pair of *A. malcolmi* in careful attendance on a ravenous and clamorous young Cuckoo, but never with any young of their own in company with it. And yet one always finds three or four of the Babbler's eggs along with the Cuckoo's, showing that it is not the parent Cuckoo in this case that gets rid of the eggs to make room for her own. It is probably the young Cuckoo that ousts his nest-fellows.

Mr. R. M. Adam says:—"On the 18th August I observed in a garden in Agra two young birds of this species—which had apparently just left the nest—being fed by an *Argya malcolmi*. There was also a young *A. malcolmi* with the party."

Major C. T. Bingham writes:—"I have several eggs which I

suspect to be those of this Cuckoo, found in nests of *Argya malcolmi*, but I am certain of only one egg, and that a wounded bird dropped. It is a bright greenish blue, highly glossed, and measures 0·99 by 0·82."

Colonel Butler remarks:—"The Crested Pied Cuckoo lays freely in the neighbourhood of Deesa in July, August, and September, commencing about the middle of the former month. The following are some of the dates upon which I found eggs:—

" July 10th, 1875. 1 fresh egg in nest of <i>Argya caudata</i> .				
" 19th,	"	"	"	"
" 24th,	"	"	"	<i>Crateropus canorus</i> .
" 28th,	1876.	"	"	<i>A. caudata</i> .
" 30th,	"	"	"	"
" 30th,	"	"	"	<i>C. canorus</i> .
Aug. 15th,	"	"	"	<i>A. caudata</i> .
" 16th,	"	"	"	"
" 16th,	"	1 young bird	"	"
" 17th,	"	1 fresh egg	"	"
" 23rd,	"	1 incubated egg	"	"
Sept. 25th,	"	1 fresh egg	"	"

"The egg as a rule is a very perfect oval, blunt at both ends; in colour a deep greenish olive, sometimes inconspicuously marked with small dark greenish blotches or stains at one end. The number of Babblers' eggs in the nests I have mentioned varied from two to four. In some instances the Babblers' eggs were about to hatch (chipped), and yet the Cuckoo's egg was quite fresh; and in one instance I found a fresh Cuckoo's egg in a nest with three young birds, so that no rule can be laid down as to when these Cuckoos lay their eggs. In fact they seem to deposit them at any time, quite regardless of the condition of the eggs of the nest in which they are laid. I have often noticed also that when they discover a nest which does not suit them to lay in, they almost invariably destroy the eggs of the Babbler by driving a hole into them with their beaks, and sucking a portion or the whole of their contents."

Mr. E. Aitken records the following note:—"About the end of July 1875 two eggs were brought to me, in the nest of a Babbler, presumably *A. malcolmi*. They were remarkably round, almost as much so as those of *Merops viridis*. On puncturing them preparatory to boring a hole, I discovered they were hard-set. One of them broke during the operation and contained an almost perfectly formed foetus, in which I was easily able to detect the scanorial foot of a Cuckoo, by its long and reversible outer toe. I send you this egg; it measures 0·90 in length by 0·78 in breadth. The other was not so far advanced, the chick was extracted piecemeal; but by placing the tarsus and foot in weak spirit and water and examining it with a needle, I was enabled to trace the same peculiarity. I carefully compared the feet of foetal Babblers with these, which I preserved in spirit, three days after, and found that the Babblers had remarkably stout feet; so I think there can be no

doubt of the correctness of my identification. This egg measures 0·86 in length by 0·77.

"In 1876 I extracted an egg from the oviduct of a female *Oocystes jacobinus* shot off the telegraph-wires at the station of Jura, which was the counterpart of the pair I speak of. The same season I got a similar egg along with three of *A. malcolmi* and immediately recognized it.

"All four eggs were fresh, the parasitical one quite so. Whenever I have a lot of eggs, I always puncture them first and bore them afterwards. In doing this I could not help noticing that the Cuckoo's eggs required twice as much pressure to prick, and seemed to have a very much thicker shell, the albumen was also of a beautiful blue-green colour, that of the Babblers colourless. This egg measures 0·94 by 0·75, and has so thick a shell that it has some species of entozoa embedded in a double spiral, in a sort of calcareous deposit at one end."

Colonel G. F. L. Marshall says:—"An egg which I took from the oviduct of a female in July was nearly round, of a deep blue colour, and with a very hard thick shell; I do not know if this latter character is constant, but if so it would serve at once to distinguish these eggs from eggs of the *Crateropi*. It has not, I believe, been noticed before."

Mr. J. Davidson tells us that this Cuckoo is "very common in all the scrub jungles round Dhulia, laying in the nests of *A. malcolmi* and *A. caudata*; from the eggs of the latter its eggs are readily distinguishable."

Mr. Rhodes W. Morgan, writing from South India, says of this Cuckoo:—"It deposits a single egg of a very brilliant greenish blue, the greenish tinge predominating, in the nest of *Malaccocercus griseus*. Both extremities of the egg are alike in shape. Lays from March to May. Before dropping its own egg it always ejects one of the eggs of the rightful owner."

Colonel W. Vincent Legge, writing of this species in Ceylon, says:—"An egg ready for expulsion was found in a bird of this species killed last November at Puttalam, Western Province. It is now in the Museum of the R.A. Society of Ceylon, and is of a pale sky-blue colour, measuring 0·95 by 0·74. Mr. Holdsworth, P. Z. S. 1872, p. 432, supposes it to lay in the nest of *Malaccocercus striatus*, and Layard found a young bird under the care of a pair of these Babblers."

The eggs of this species are well fitted for deposit in the nests of the various species of Babblers (*Argya* and *Crateropus*), usually chosen as foster-parents for its young by the Crested Pied Cuckoo. In colour they are a spotless blue, darker or lighter in different specimens; but all are highly glossy and closely resemble the eggs of *Argya caudata*, in whose nest also this bird occasionally deposits its eggs. Even from the eggs of *Crateropus malcolmi*, in whose nest they are in Upper India, most commonly found, it is only by their somewhat diminutive size and very round oval shape that they can be distinguished. This Babbler itself, however,

sometimes, I am inclined to believe, lays abnormally small eggs of this shape; so that the only specimens that I really fully rely on are those which have been taken out of the oviduct of the female: these are very round ovals, recalling in shape the eggs of the Bee-eaters, very glossy and of a delicate full-sky blue. Those obtained from the nests to and from which the bird had been watched are exactly similar, but of a somewhat darker and deeper hue.

The eggs vary in length from 0.9 to 0.98 inch, and in breadth from 0.72 to 0.82 inch; but the average of a series is 0.94 by 0.73 inch.

Coccytes coromandus (Linn.). *The Crested Red-winged Cuckoo.*

Coccytes coromandus (Linn.), *Jerd. B. Ind.* i, p. 341; *Hume, Rough Draft N. & E.* no. 213.

An egg that I possess of the Crested Red-winged Cuckoo was obtained for me by my friend, the late Mr. Irwin, in Tipperah. It was extracted from the oviduct of the female. In shape it is a very broad oval, and in texture fine and glossy. In colour it is a moderately pale, somewhat greenish blue, uniform throughout, without any specks or spots; although considerably larger, it in other respects closely resembles some eggs of *C. jacobinus*.

It measures 1.05 by 0.92 inch.

Mr. Mandelli sent me a nest in which he says that four fresh eggs of this species were found on the 20th May, at Namtchu in Native Sikhim. It was placed on the branches of a very large tree at a height of twenty-five feet from the ground. A fifth egg was extracted from the oviduct of the parent-bird. All the five eggs are precisely alike, and like others that I have myself extracted from the oviduct of this species. I cannot, however, for a moment believe that the nest really belonged to this Cuckoo. She was shot on it no doubt when about to lay the fifth egg, having selected the nest of some bird, probably some Babbler, whose eggs closely resemble her own. The nest is a moderately deep cup four inches in diameter, composed externally of dry leaves loosely bound together with coarse grass, and lined with fine wire-like twigs, flower-stems, as I guess, of some herbaceous plant. The nest is very similar to some I have seen of *Garrulax moniliger*, and again of *G. leucolophus*.

Captain Feilden remarks:—"This bird is the commonest Cuckoo at Thayetmyo; in the thicker parts of the jungle every bamboo-filled valley contains one or more pairs. They arrive in the beginning of the rains, and the young birds do not leave till October. They lay in the nest of the Quaker Thrushes I believe, as I have frequently shot the young bird from the middle of a brood of young Quaker Thrushes, and, as far as I could see from the thickness of the jungle, the old Thrushes were feeding the young Cuckoo. An egg, taken from the nest of a Quaker Thrush, that I believe to have belonged to this bird was very round and a

pale blue. I believe that this bird keeps some kind of watch over its eggs, as a pair have sometimes seated themselves near me uttering a harsh, grating, whistling scream very unlike their usual magpie-like chatter, and I afterwards found a young Cuckoo in company with a flock of Thrushes that were constantly to be found in that bamboo clump."

Mr. J. Darling, Jun., says:—"Shot a hen at Kaukarit in Tenasserim, with a fully formed unshelled egg in the oviduct. No nest was to be seen anywhere about."

Eudynamis honorata (Linn.). *The Indian Coel*.

Eudynamis orientalis (Linn.), *Jerd. B. Ind.* i, p. 342.

Eudynamis honorata (Linn.), *Hume, Rough Draft N. & E.* no. 214

The great majority of the Coels lay in June; but I have obtained their eggs both in May and July. With one single exception, when I obtained an egg from the nest of *Corvus macrorhynchus*, every one of the fifty odd eggs that I have taken or received at different times have been found in nests of *Corvus splendens*.

Mr. Blyth recorded the following remarks in regard to the eggs of this species:—"The female appears to deposit her eggs invariably in the nests of the true *Corvi*, and so abundantly that we have known five or six Coels' eggs to be brought in together by a person who had been destroying Crows' nests, each taken from a different one. The egg is certainly so often found alone that there can be little doubt that the Coel destroys the eggs of the Crow at the time her own is deposited; but it is doubtful whether the young Coel is endowed with the instinct of ejecting any companions it may have, and it would seem that it has not that propensity; but the fact remains to be systematically observed. Mr. Frith informs us that he has never found more than one Coel's egg in a nest, and in his long experience has only met with it in those of the two Indian Crows."

My experience differs in some important particulars from Mr. Blyth's. In the first place, I deny that the Coel's eggs are generally found alone; in thirty cases of which I have notes there is no single instance of the egg being found alone. It is not the eggs that are destroyed, but the young Crows that are got rid of, probably by the young Cuckoo; I have found the latter in a nest with three young Crows, all freshly hatched, and a week later have found the young Crows "missing" and the young Cuckoo thriving. In the next place, I have repeatedly found two Coel's eggs in one nest.

Mr. Brooks remarks:—" *Eudynamis honorata* lays its eggs in the nest of the common Crow, *Corvus splendens*. I have found two eggs in the same nest. They are one-third smaller than the Crow's eggs, more oval, of an oil-green ground-colour, with brown spots thickly marked over the egg and more numerous at the large end."

Mr. W. Theobald makes the following remarks on the breeding of this bird in Monghyr:—"Lays in the third week of June. Eggs, one only; shape, ovato-pyriform; size, 1.2 inch by 0.9 inch; colour,

pale dirty green, much blotched with reddish brown. Had but one egg brought, and the man reported four Crow's eggs in the same nest."

Elsewhere I have said, writing from Bareilly:—"As we stood waiting for the eggs of the King-Crow to be brought us, a speckled female Coël suddenly emerged from a group of mango-trees in our own compound, pursued by several Crows. The Coël is a parasitic Cuckoo, famous in Indian song as the harbinger of that glad rainy season, when, to quote the Indian poet, the sun-parched widowed earth puts off her withered, dust-soiled weeds, and, soon to become the joyful mother of autumn's harvest, dons a fresh bridal robe of green. Throughout the rains the loud whistled cry, 'who are you?' rings through every copse, and the Coël has from very early times been as great a favourite with the people of Hindustan as ever the Cuckoo was with us. When we came to inspect the clump of mango-trees out of which the angry Crows had come, we found in them no less than seven of their nests, and in two of these discovered unmistakable eggs of the Coël. Did these two both belong to the fugitive female discovered when for the third time she made the attempt? Were they the eggs of sister adventurers, who had put her up to the locality as one in which business was likely to be done? I confess I am not deep enough in the secrets of the mottled ladies, whom respectable Crow matrons doubtless look upon as the worst of 'social evils,' to answer these questions, but about the eggs there could be 'no deception.'"

One curious fact remains to be noticed. I have never seen Crows feeding fully fledged Coëls out of the nest, whereas I have repeatedly watched adult female Coëls feeding young ones of their own species. I am pretty nearly convinced that after laying their eggs the females keep somewhere about the locality and take charge of the young directly they can leave the nest; but the difficulty is that, while from dissection I am convinced that they lay more than one egg, I never saw more than one young one in charge of an old female. Common as the bird is, and much attention as I have paid to their habits during the breeding-season, there is much still to be ascertained in regard to their social economy.

The late Mr. A. Anderson remarked that Dr. Jerdon "is correct in stating that the nest of the common Crow (*Corvus splendens*) is the one almost exclusively used as a nursery for the foundlings; this however, not because the Coël can be said to have any partiality for this Crow in particular, but because the other species (*C. culminatus*) does not lay simultaneously with herself. I firmly believe that if both species nested at the same time, they would be equally in demand as foster-parents. *C. culminatus* lays, as a rule, in February and March; and I have sometimes, though rarely, seen them do so as late as May and June; *C. splendens*, on the other hand, does not generally commence to build till June, which suits the Coël to a nicety."

On the 27th May he found a nest containing "three Coël's and four eggs of *C. culminatus*. This nest was built in a tree at my

garden-gate, and was watched by me in course of construction. I frequently observed male and female Coëls darting in and out of this shady tree, and during the heat of the day sitting in close proximity to, and on terms of perfect friendship with, the rightful occupants of the nest. On the 24th May the nest contained one Crow's and one Coël's egg; on the 25th I was agreeably surprised at finding that each species had laid a second egg; but on the following day, the 26th, I was amazed when my tree-climber from aloft reported that both birds had again done their duty. On the 27th I removed the contents of the nest, which contained the number above stated. The Crow on this occasion was on her nest, and the man who went up informed me that one of the small eggs (meaning the Coël's) was placed above the other six, forming as it were the corner tier.

"I would observe that the fact of *C. culminatus* laying in May was as exceptionally late for that bird as it was early for the Coël. I am consequently led to infer that these three Coël's eggs were the produce of one bird.

"It is quite clear that *C. culminatus* is easily imposed upon, and seems to be alike unaware of and indifferent to the deception practised on her; for I never once observed the above pair attempt to drive away the Coëls from the tree on which they had built. *C. splendens*, on the other hand, is thoroughly alive to the trickery; and there is hardly a day, during the breeding-season, that Coëls may not be seen making their escape from trees, hotly and unrelentingly pursued by one or more Crows of this species.

"But the curious thing in this connection is that the male Coël is just as often the object of attack as the female; and I have frequently observed both sexes flying out of the same tree simultaneously, though in opposite directions."

He concludes from the instance above given and eleven others in which, between the 8th June and the 28th August, he found one, two, or three eggs of young of Coëls along with eggs or young of Crows, "that the same Coël may lay a number of its eggs in the same nest.

"That she does not *willingly* eject the eggs of the foster-parent; and that when there is a deficiency in the normal number, it is in all probability due to *accident*, owing to the Coël's hurried movements.

"That *C. culminatus* is easily duped, while her cunning congener, *C. splendens*, is fully aware of the deception. That when the female Coël is about to intrude her egg, she is frequently accompanied by a male bird.

"That it is a common occurrence to find several Coël's eggs, as well as young ones, in the same nest, the produce of one or more parents.

"The eggs of this Cuckoo have certainly a very corvine appearance, and are well adapted to represent miniature eggs of the foster-parent. All those in my collection are of one type, and may be described as thickly blotched and spotted with reddish brown on a dark-green ground, somewhat confluent at the obtuse end. They

vary, however, in size and shape, the longest measuring 1·4 by 0·9 inch, the smallest 1·1 by 0·9 inch. Five generally, and, perhaps, sometimes six, is the number of eggs laid by this bird."

I can only say that three Coël's and four Crow's eggs out of one nest was a very remarkable find.

Dr. Scully remarks of the Coël in Nepal:—"The Indian Coël is a seasonal visitor to the valley, arriving about the end of March or beginning of April, and departing in September. It frequents the woods of the central part of the valley, gardens, groves, and trees, near houses and villages; in April, May, and June its well-known cry may be constantly heard. The eggs are laid in the nest of the common Crow (*C. splendens*), as in the plains of India."

Colonel Butler remarks:—"The Indian Coël breeds in the neighbourhood of Deesa towards the end of the hot weather, commencing about the first week in June. I took eggs this year upon the following dates (1876):—

' June 7th.	1 fresh egg in nest of <i>C. splendens</i> with 3 Crow's eggs.				
" 14th.	2 fresh eggs	"	"	3	"
" 17th.	1 fresh egg	"	"	4	"
" 21st.	1 "	"	"	3	"
" 21st.	1 "	"	"	3	"
" 21st.	1 "	"	"	4	"
" 21st."	1 "	"	"	3	"
" 27th.	2 addled eggs	"	"	3 young Crows.	
" 27th.	1 fresh egg	"	"	5 Crow's eggs.	
July 1st.	2 fresh eggs	"	"	1	"
" 3rd.	3 "	"	"	3	"

"On the 8th July I saw two Crows pursuing a male Coël, and after a long chase the Coël dashed into a low bush, from which the Crows drove it into a thick euphorbia hedge; they then attacked it vigorously, and the bird was so frightened that I dismounted from my horse and caught it in my hand. The following day a beautiful female specimen was mobbed to death by Crows in the compound next to mine, and brought to me by the men who saw it killed. When the hen bird lays she often turns some of the Crow's eggs out of the nest, as I have several times examined Crows' nests and found three or four eggs one day, and on examining them a day or two later have found some of the Crow's eggs missing and Coël's eggs in their place."

And again:—"In Belgaum Coëls lay much earlier than in Guzerat. The first egg I got this year was on the 13th April, when two were brought to me quite fresh. On the 16th I got two more fresh eggs, on the 18th two more, and on the 27th another, also a young bird ready to ffly; the egg of this latter must have been laid about the middle of March. Another fresh egg on the 28th April, and in the same nest two more eggs on the 1st May, upon which date I also took two more fresh eggs, one being laid in a nest by itself, evidently before the Crow had commenced to lay, as the nest was empty the day before. On the 5th May I took 9 more fresh eggs, and again came across a nest in which the Coël had laid before

the Crow. On the 9th May I took 10 more fresh eggs, five of which were laid in a nest containing a single Crow's egg, from which I had taken two Coël's eggs on the 5th inst. ; and being of three distinct types, in all probability they were laid by two or three different birds. This is the largest number of Coël's eggs I have ever seen in one nest. Three are not an unusual number to find in a nest, and two occur constantly. On the 12th May I took 3 more fresh eggs, and on the 15th May 4 more, two of the latter being in a nest by themselves that was empty when I visited it on the 12th inst. All of the above eggs were taken out of nests of *C. splendens*, and in no one instance did I find an egg in the nest of *C. macrorhynchus*, although the Large Crows' nests were more common in that part of camp where the Coëls frequented than the other species."

Colonel W. V. Legge, writing from Ceylon, says:—"The eggs of this species have been identified for the first time in this island, during the present year. In May three batches were found near Bolgodde, in the Western Province, all in nests of *C. culminatus*. In one nest there were 4 Crow's and 4 Coël's eggs; in another 5 Crow's and 3 Coël's; and in the third 2 Crow's and 4 Coël's. The parasite eggs varied in character considerably, and two nests contained two types. I have long known the Coel to be resident in Ceylon, though a want of knowledge of the range of birds here has induced some to consider it migratory."

Mr. A. G. Cardew, C.S., records the following dates on which he found eggs of the Coël in Madras:—

"June 21st. 2 eggs from nest of *Corvus splendens* which contained no Crow's eggs, fresh.

"June 23rd. 1 egg from nest of *C. splendens* which contained 4 Crow's eggs, slightly incubated.

"June 24th. 2 eggs from nest of *C. splendens* which contained 1 Crow's egg, fresh.

"June 25th. 2 eggs from nest of *C. splendens* which contained 2 Crow's eggs, all incubated."

The eggs of the Coël are much about the size of a common Blackbird's egg, but more compressed towards the small end, and I have seen what I was informed was a variety of the Ring-Ouzel's egg by no means unlike a specimen I possess of the Coël's egg. The texture of the egg-shells is very compact and fine, but they are entirely devoid of gloss. There is some faint general resemblance between their ground-colour and that of the eggs of *Corvus splendens*, in whose nest they are in Upper India almost exclusively deposited, but I never saw a single egg of this Crow that could for one instant be mistaken for that of the Coël. The ground-colour varies much: pale sea-green, pale dingy green, dull olive-green, pale olive-brown, and dingy stone-colour, are all met with. The markings, specks, spots, streaks, and clouds, the predominant character being streaky, vary alike in extent and in shade and intensity of colour. The markings are almost invariably most numerous towards the large end, where they often form an

irregular imperfect zone, or sometimes a mottled cap; but while in some eggs the markings are almost exclusively confined to the broader half, where they are but thinly sprinkled, in others they almost hide the ground-colour throughout and are nearly confluent over the whole upper end. In colour the markings are olive-brown, reddish brown, and dull purple; the reddish-brown and purplish markings predominating on stone-colour and dingy grounds, and the olive-brown where the ground-colours are brighter green. They vary little in shape or size, but are a moderately broad oval, somewhat compressed towards the smaller end.

The eggs vary in length from 1.08 to 1.29 inch, and in breadth from 0.89 to 0.96 inch; but the average of the series is 1.19 by 0.92 inch.

Subfamily PHÆNICOPHÆINÆ.

Rhopodytes tristis (Loss.). *The Large Green-billed Malkoha.*

Zanclostomus tristis (Less.), *Jerd. B. Ind. i.*, p. 345; *Hume, Rough Draft N. & E.* no. 215.

Dr. Jerdon says:—"The eggs were brought to me at Darjeeling, two in number, pure white, and of a long oval form. I did not see the nest, which was said to be a large mass of sticks and roots. I took another similar egg from the oviduct of a female which I shot."

Mr. Davison obtained an egg of this species which he extracted from the oviduct of a female killed at Meeta Myo, Tavoy District, Tenasserim, on the 20th April, 1874.

The egg is almost cylindrical in shape, excessively obtuse at both ends, and very little curved on the sides. The shell is rather chalky, and though tolerably smooth and soft to the touch is entirely devoid of gloss. The colour is pure white, and the egg measures 1.36 in length by 1.05 in width.

In 1875 both Mr. Cripps in Sylhet and Mr. Gammie in Sikhim found nests and took the eggs.

The following is Mr. Cripps's account:—"Sylhet, 12th May, 1875. A female was shot off the nest; this was placed on a small tree (about 4 feet off the ground on top of a teelah in amongst tea-bushes, although heavy jungle was alongside) in a fork where several branches originated, and was a very slight structure, carelessly made, consisting of twigs over which a layer of green leaves had been placed. These were dry, though when I got them the nest was more a scaffolding than anything else; the chicks were half-formed, the egg-shells have been considerably soiled from the bird's droppings. On the 18th May another nest was found; this time in heavy tree-jungle, about 12 feet off the ground; the nest was the same as the foregoing, and contained only one fresh egg. During the breeding-season this bird's call, a low sweet hoat, is heard every now and then.

"On the 30th June 1875, a female, with three eggs, was brought to me with the nest, which was placed in the fork of a small tree (about 15 feet high) where three branches met and some 6 feet off the ground. A number of the small living twigs had been bent down, and over these was placed a layer of twigs overlaid with a layer, $1\frac{1}{2}$ inch thick, of leaves which had been plucked green. There was hardly any egg-cavity perceptible; the eggs were partly incubated."

From Sikhim Mr. Gammie writes:—"On the 10th May a native brought me a nest containing three partially-incubated eggs, and a female of this species which he said he had caught on it. The nest, he said, was placed in the middle of a large bamboo-bush, on the branchlets, within eight feet off the ground. The man declared that he had brought me the whole of the nest, but I do not feel sure about this: of what he brought, the egg-cavity was little better than a mere depression, about 4 inches in diameter, and gradually deepening inwardly to about 1.25 inches in the centre. The body of the nest was a collection of twigs about the thickness of a goose-quill. On the top of the twigs came a quantity of green tree-leaves and dry bamboo-leaves; then a neat lining of quite green leafy twigs for the eggs to rest on. It was taken at Mougpoa at 3000 feet elevation."

The eggs obtained by Mr. Gammie in Sikhim, Mr. Cripps in Sylhet, and Mr. Davison in Tavoy are quite of the *Centrococcyus* and *Taccocua* type. Typically long cylindrical eggs, obtuse at both ends, often not unlike in shape some of our Turtle's eggs, but often again very regular and moderately broad ovals, and at times though rarely quite broad ovals; in colour dead glossless white, commonly with larger or smaller portions of their surfaces covered with dirty yellowish-brown, more or less glazy, stains.

Five eggs vary from 1.33 to 1.37 in length, and from 0.98 to 1.05 in width.

Mr. Oates remarks from Pegu:—"June 11th. Nest seven feet from the ground in the fork of a leafy shrub. A mere platform of dead twigs lined with leaves, very loosely laid. The whole structure meagre and incoherent, measuring 10 inches by 6 and a few inches thick. It contained one fresh egg, very chalky and with little gloss; colour pure white. The egg measured 1.27 by 1.0.

"September 10th. Nest in a bamboo-bush about 20 feet from the ground, of very irregular shape and unmeasurable. Composed of much the same materials as the nest described above. Two eggs, nearly ready to hatch off. Colour originally white, but now much stained with yellowish smears. Very little gloss and extremely fragile. The two eggs measured 1.4 by 1.05 and 1.33 by 1.05.

"June 20th. Nest with two incubated eggs.

"June 21st. Nest with two fresh eggs.

"The position of these was much the same as above described, viz., in bamboo-trees."

Major C. T. Bingham notes that this species is "a common bird in the Thoungyeen valley. The following is a note of finding its nest and eggs that I recorded long ago :—

"On the 13th March I found a nest of the long-tailed Malkoha near Poodeesaki village in the Meplay forest, shooting the female as she flew off the nest. It was a loose and very untidy mass or pad of half-dried leaves and twigs, and contained three pure white, chalky cylindrical eggs, placed in the head among the dense leaves of a pollarded evergreen of some kind. I had some difficulty in finding it, and two hours waiting before I managed to trace the bird back and shoot her.

"Since sending my last note on the breeding I have taken five more nests—two containing one egg each, two, three eggs, and one, one egg. The nests were all of the same type as that first described, some perhaps a little firmer and better built. All were placed low, varying from three feet to ten, in bamboo and other bushes, invariably a thick and leafy one. One or two of the eggs I got are curiously stained, probably by the leaves with which the nest was made.

"It would seem that this bird breeds from March to July, as Davison shot one in July with a fully formed egg."

"The eggs taken by Major Bingham are of the usual type, very regular, moderately elongated, in some cases somewhat cylindrical, very broad and obtuse at both ends, which in most of them are precisely similar. The shell, though smooth to the touch, looks somewhat coarse and chalky. They are entirely devoid of any gloss. In some the shell is pure white, in others, as is customary in eggs of birds of this family, soiled and smeared with yellowish-brown stains. They vary from 1.32 to 1.6 in length, by 0.98 to 1.12 in breadth.

Rhopodytes viridirostris (Jerd.). *The Small Green-billed Malkoha.*

Zanclostomus viridirostris, Jerd., Jerd. B. Ind. i, p. 346.

Mr. A. G. Cardew, C.S., writing from Madras, says :—"I obtained a single nest of this bird on the 10th March, 1885, near Wandiwash in the North Arcot District. It was a slight structure, made of a few twigs and with a few green leaves as lining, and was placed about 5 feet from the ground in a thorn-bush near a stream. The nest contained two dull chalky-white eggs, in shape very round ovals, measuring 1.15 by 1.0."

Mr. Henry Wenden writes :—"My shikary found a nest of this bird in the middle of July 1875, in the dense jungle-covered Granite Hills about 8 miles N.E. of Nulwar station, which is on the S.E. branch of the G.I.P. Railway, 384 miles from Bombay.

"He shot, sexed, and stuffed both male and female.

"He has for a long period been working for me in collecting specimens, eggs, &c., and has been fairly well trained as to what points to observe and how useless eggs are to me unless all infor-

mation regarding them is 'pucca,' so, although I must regret that the following account of the nidification of this species is not from my personal observation, I feel that I may offer it to you as being reliable.

"The nest was situated about 6 feet above the ground in the tri-pronged fork of a very dense prickly bush of from 8 to 10 feet in height, and growing in a thicket of similar and other bushes on the bank of a nullah, running between two steep jungle-clad hills. It was simply a roughly constructed mass of dry sticks and twigs, with a small shallow cavity lined scantily with dry neem-leaves, which had the appearance of having been green when first placed in the nest and not of having been picked dry and withered from the ground. Barring the leaves, he said the nest was more like that of a Dove's both in size and shape than any other nest he knew. It was built in the very thickest part of the bush, entirely concealed from view by the foliage, until carefully searched for.

"It contained two eggs. Dull glossless white, of a finer texture than those of *Centrococcyx rufipennis*, though they possess the same chalky covering. In shape they are long oval, slightly compressed at one end, and both ends very blunt or round. Size 1.12 x 0.87.

"I think this species is tolerably abundant at Nulwar, as I have more than once seen it with the Southern Sirkeer and other birds settle in trees close to my position when I have been waiting for a line of beaters to come up."

Subfamily CENTROPODINÆ.

Centrococcyx rufipennis (Ill.). *The Indian Coucal*.

(*Centropus rufipennis* (Ill.), *Jerd. B. Ind.* i, p. 348; *Hume, Rough Draft N. & E.* no. 217.

The Indian Coucal or Crow-Pheasant breeds throughout the plains of Upper India during the rainy season. I have found eggs as early as the 1st of June and as late as the 5th of September.

They build, most commonly, a huge, globular domed nest, at varying heights from the ground, in the centre of thick thorny bushes or trees. The nests are usually of dry twigs, lined with a few green leaves, but all kinds of odds and ends are at times incorporated into the fabric.

Occasionally quite different materials are made use of, the nest consisting almost wholly of leaves, rushes, or coarse grass.

The nests are hollow oblate-spheroids, some 18 inches in external diameter, and 6 to 8 inches in height, with a large hole on one side, from the entrance of which to the back of the nest inside may be 12 inches. This of course is not long enough to admit the whole bird, so that when sitting the tail is constantly

seen projecting outside the nest. When in this position the bird is about as defenceless as the traditional Ostrich which hid its head in the sand; but in Australia the Coucal (*C. phasianus*) manages these things far better. There, we are told:—

“The nest, which is placed in the midst of a tuft of grass, is of a large size, composed of dried grasses, and is of a domed form with two openings, through one of which the head of the female protrudes while sitting, and her tail through the other.”

On the other hand, the Southern Chinese Coucal, which Swinhoe declares to be identical with ours, goes a step further and gets rid of the dome altogether. “I have never found,” remarks Mr. Swinhoe, “the nest domed as is that of *C. viridis*. It is shaped like a long narrow basket, made almost entirely of fresh grass, suspended in the centre of a thick hedge, and usually contains four pure white eggs, ovate and not roundish as those of its small ally. This Crow-Pheasant is a resident bird in South China, ranging a few hundred miles above Foochow, not quite so far north, I think, as Ningpo.”

But even in India the nest is not always domed; I have seen fifty nests at least, and all were so, but my friend Mr. F. R. Blewitt, a most accurate observer, gives me the following note on the subject:—“Breeds, as far as I have been able to ascertain, from June to August. My experience goes to prove that it does not *always*, as related by Jerdon, select ‘dense and inaccessible thickets’ for its nest. I have found it high up on tamarind and other trees fully exposed to view; the only difficulty was in getting to the nests, which generally were placed at the further end of a branch, between two or three forks. The nest is large in size, formed of various kinds of twigs and leaves of the dhak, jamoon, siris, neem, &c. No other material was used in the nests. The nest in structure is not always dome-shaped. Of six nests, two only were domed at the top; the other four, formed of twigs and leaves, were simply nests about the size of a very large round plate, with a depression in the centre for the eggs. I may add that the *thickness* at the base and sides, of the twigs and leaves which are both used in the building of the nest, varies from 8 to 10 inches. I did not find more than three eggs in any one nest, though I have reason to believe that four is the maximum number. They are pure white and in shape oval. The exterior of the shell is, as it were, covered with a soft chalk-like substance, easily scratched with the nail.”

Mr. W. Theobald makes the following remarks on the breeding of this bird in Monghyr:—“Lays in June and August; eggs, four in number, oval, measuring from 1·30 to 1·47 inch in length, and from 1·09 to 1·21 inch in breadth; colour, pure white; nest placed in dense trees, a neat but loose structure of twigs, domed, and with aperture in the side, lined with dry leaves.”

Dr. Jerdon states that “it makes a large nest of twigs or grasses of green flag-leaves domed at the top, and the aperture on the side, and lined with dried leaves. It is usually placed in the most

dense and inaccessible thickets. The eggs are two to five in number, pure white and oval. Burgess says that the exterior of the shell is very soft and of a chalky texture, easily getting scratched or stained. This, as Mr. Blyth remarks, shows an affinity to the eggs of *Crotophaga*, which are white, rough, and chalky externally; but if this layer be detached, the egg is shown to be deep blue. It breeds from January to July, according to the locality."

Three is certainly the normal number of the eggs, though four and even five are at times met with.

Major C. T. Bingham says:—"At Allahabad I found two nests of this bird. One, on the 28th June, was a large domed nest, constructed of babool, neem, and mango-branches, lined with grass and strips of aloe-leaves, and placed in an aloe-hedge not 6 inches from the ground.

"The second nest I found on the 16th August in a small mango-tree; this was a huge mass of twigs, with the dry and decayed leaves still attached, and lined with leaves and decaying grass."

Colonel G. F. L. Marshall remarks:—"I found a nest of this species in the Nawabgunj Gardens at Cawnpore in the middle of May, with eggs nearly hatching. I have found the nest in trees and thorny bushes, but according to my experience the commonest position is in a thick tuft of surkerry grass about 3 feet from the ground."

Colonel Butler makes the following remarks:—"I found a Crow-Pheasant's nest on the 20th July, 1876, at Deesa, containing three fresh eggs. The nest, which consisted of a mass of dead sticks lined with a thick pad of green leaves (strips of plantain-leaves, mulberry-leaves, &c.), and open at the top, was built about 18 feet from the ground, in a tree overgrown with a dense creeper. This pair of birds built a nest in a tree adjoining at the beginning of June, and after the hen-bird had sat for three or four days, I sent a boy up the tree, and to my astonishment found the nest empty. The birds, seeing the nest was discovered, forsook it and built another in the next tree. Again, the old hen sat closely for several days, when, thinking that the eggs would be spoilt if left longer, I sent a boy up to the nest, which, like the other, was empty. The birds forsook this nest also and disappeared for several days, during which I several times observed them in other parts of the camp. At length they returned and built the nest above described. The eggs have a very hard chalky shell, and are of a dirty white, often much stained. In fact I have often failed to clean them even with soap and water. As soon as the hen-bird commences to sit, both birds keep as much as possible out of sight, hiding themselves most of the day in dense trees when the hen is not actually on the nest, and when she is on the nest the cock-bird is usually to be found hiding himself somewhere close to the nest. When thus engaged he will generally allow himself to be approached to within a few yards without moving.

"On the 10th August I found another nest in the same neighbourhood, domed, containing an addled egg and two half-fledged young ones. The egg was so discoloured from incubation &c. that I destroyed it.

"On the 12th August I found another nest in a similar situation, namely, at the top of a dense thorny bush in some bush-jungle, containing two fresh eggs. I found several other nests at the end of August and in September, some domed, some open at the top, containing fresh and incubated eggs."

Mr. Benjamin Aitken writes as follows:—"I have notes of only two nests of the Indian Coucal, and neither of them was in the centre of a thicket. Both were found in Berar. One was about 12 feet from the ground, among the lower outermost branches of a large tamarind-tree. The whole time the birds were courting and the nest building, the birds kept up an unceasing hooting to each other, and once, when the moon was shining brightly, I heard them at dead of night. On the 25th June the nest was found to contain four eggs, of which two were taken. I expected, considering what a wary bird the Crow-Pheasant is, that the nest would be deserted; but, notwithstanding that the man who went up left by mistake behind him a scarecrow in the shape of a most forbidding piece of rag, half a yard long, the two remaining eggs were incubated and hatched. The young birds left the nest long before they could fly, when they were still absurdly small, and had tails only 3 inches in length. It may be the common habit of these birds to leave the nest thus early, and skulk about thick hedges, avoiding observation, till they are fit to be seen; but I rather believe that, like Black Robins, Rollers, and other birds that are naturally shy about their nests, young Crow-Pheasants are usually not introduced to society till they are scarcely distinguishable from their parents.

"Nest No. 2 was found about the last day of June in a small babool tree, and contained three eggs. Both nests were dome-shaped and carelessly constructed."

Miss Cockburn, writing from the Nilghiris, says:—"These birds build in large bramble-thickets, so that their nests are not easily got at. They put a quantity of sticks together and form a very spacious nest, the materials being placed all round except at the entrance, and also forming a high canopy above much in the style of the English Magpie. It uses every precaution to ensure the preservation of its own progeny, as if it argued from its evil propensities that 'what birds have done, birds may do,' and that some day its own abode might be invaded by its numerous feathered neighbours towards whose domestic rights it has shown so little respect. The Black-and-Red Cuckoo builds in March and April, and the hen lays three large white eggs."

An egg which Miss Cockburn sent me was most abnormally elongated, measuring 1.52 in length by only 0.98 in width!

Mr. A. G. Cardew, C.S., writes from Madras:—"A nest with eggs just ready to be hatched taken on 9th March; and a

newly-built nest, with one fresh-laid egg, found as late as 20th July."

Mr. Rhodes W. Morgan, writing from South India, says :—" It breeds in dense thorny bushes, building a domed nest with an aperture in the side. The nest is composed of green leaves and twigs carelessly woven together. The eggs are from two to three in number, and of a dull white. They are covered with a chalky epidermis, which, when removed, leaves the shell of a pure white, and not of a beautiful blue as in the case of *Crotophaga ani*. The dimensions of an egg in my collection are 1·5 inch in length by 1·21 in breadth."

In Ceylon, we are informed by Colonel W. V. Legge, this species breeds from May to September.

The eggs vary little in size or shape—broad regular ovals, almost perfectly symmetrical at both ends; they closely resemble, so far as size and shape go, those of our Common Blue Pigeon (*C. intermedia*). In texture they are rather coarse and somewhat chalky, and are normally of a dull pure white, but they are not unfrequently covered, when first found, with a pale yellowish-brown glaze or size, which readily washes off, but which, so long as it remains on them, imparts to them a certain amount of gloss.

One specimen from Tipperah, sent me by Mr. Irwin, is very nearly spherical and of a very pure white.

In length the eggs vary from 1·3 to 1·55 inch, and in breadth from 1·12 to 1·25 inch: but the average of a large series is 1·44 by 1·16 inch.

***Centrocoocyx andamanensis* (Tytlér). *The Andaman Coucal*.**

Centropus andamanensis (Tytlér), *Hume, Rough Draft N. & E.* no. 217 bis.

The Andaman Coucal breeds (of course in the Andamans) during the latter part of the hot weather and the beginning of the rains. I have no detailed information as to its nidification, but Captain Wimberley, who sent me two eggs which he took in the neighbourhood of Port Blair, informs me that he took them in June, and that the nest was composed of sticks and placed in a tolerably high tree in secondary jungle. The eggs are of the usual Coucal type, broad ovals, very obtuse at both ends; in colour a dull, much-soiled white, with very little gloss; and measuring 1·32 by 1·12 inch, and 1·36 by 1·1 inch.

***Centrocoocyx intermedius*, Hume. *The Burmese Coucal*.**

Centrocoocyx intermedius, *Hume*; *Hume, Cat.* no. 217 quat.

Mr. J. Inglis writes from Cachar :—" This bird is exceedingly common, frequenting tall reeds and other jungle along the banks

of rivers and jheels; breeds from June to September; remains all the year."

Mr. Oates records the following note on the nidification of the Burmese Coucal:—"August 24th. Nest 4 feet from the ground in thick elephant-grass, to several stalks of which the nest was attached. A domed structure 18 inches in height and 14 outside diameter. The bottom, 4 inches thick, and the walls and roof very strong but thin, and allowing everywhere of the fingers being inserted. Composed entirely of the leaves of elephant-grass, the living heads of the supporting stalks being bent down and incorporated with the structure to form the roof. Entrance oval, about 6 by 4, with its lower edge about 2 inches above the egg-chamber. Two eggs quite fresh, but the female incubating. Colour pure white, the shell very chalky and with very little gloss. Eggs measured 1.4 by 1.18 and 1.36 by 1.15.

"July 15th.—Nest in small bush-jungle in the centre of a den a shrub, 10 feet from the ground. Contained two young birds about a week old, covered with porcupine-like quills and smelling most atrociously. Nest made of dead leaves and grass, massive and cylindrical, about a foot long and 9 inches outside diameter.

"August 26th.—Nest with three eggs, fresh, built near the top of a tree about 20 feet from the ground. One of the eggs had blood-vessels in the inner lining, showing that it had been slightly incubated, whereas the other two were quite fresh. Dimensions: 1.4, 1.42, 1.4 in length, by 1.15, 1.12, 1.13 respectively in breadth.

"The above three nests were found near Pegu."

The eggs of this species are typically broad ovals, sometimes, however, rather more cylindrical, and occasionally slightly pyriform; the shell is fine and compact, not chalky; they are pure white, entirely devoid of gloss when first laid, but, as in other species of this family, as incubation proceeds the eggs get more or less covered with yellow or brownish-yellow gunny stains, which have more or less gloss.

***Centrococcyx maximus*, Hume. *Hume's Coucal*.**

Centrococcyx maximus, Hume; *Hume, Cat. no. 217* quint.

Mr. Scrope Doig, writing from the E. Narra river, in Sind, says:—"Got several nests of this species in July and August, greatest number of eggs in one nest being three. All the nests, except one, were built in tussocks of grass growing up in the middle of either a kundy or tamarisk tree or bush. They were domed at top with an aperture at the side, and were formed entirely of the grass belonging to the tussock itself. The one instance in which the nest was different was where the bird had taken possession of an old nest of the White-breasted Water-hen, and out of which very nest I had, some twelve days previously,

taken three eggs belonging to the Water-hen. In every other instance the nest was a domed one, in clumps of grass out in the water, and made about 3 feet over water-level, or about 2 feet over the usual high-water level."

The eggs sent me by Mr. Doig are very similar to those of *C. rufipennis*, but, as might be expected, run larger. Some are very spherical, others rather elongated cylindrical ovals, but all are extremely blunt at both ends; they are pure white, with a certain amount of gloss in places, dependent on a thin, slightly yellowish glaze, which, when first laid, covers the whole egg, but which soon and easily wears off and scratches away, leaving a snow-white rather chalky shell below.

The eggs vary from 1.3 to 1.53 in length by 1.08 to 1.23 in breadth.

Centrococcyx bengalensis* (Gm.). *The Lesser Coucal.

Centropus viridis (Scop.), *Jerd. B. Ind. i*, p. 350.

Centropus bengalensis (Gm.), *Hume, Rough Draft N. & E.* no. 218.

Colonel Tytler, in his 'Avifauna of Dacca,' tells us that he "obtained the nest and egg of this bird (the Lesser Coucal) during the month of June; the eggs are pure white and very round in formation. The nest, which was composed of straw and grass, resembled a large ball supported on sticks, with a hole in the side for the bird to enter; the nest was well concealed, and was with great difficulty discovered."

Dr. Jerdon says:—"I have had the opportunity of seeing this species at Dacca, where it is certainly very abundant. I also obtained two nests, the one with two, the other with four white eggs. The nests were in both instances formed by the living grasses rudely bent down among the thorny twigs of a bush to form a seat for the eggs, and then continued upwards, forming a dome over the nest."

Captain E. R. Shopland, I.M., writes:—"Took a nest containing three eggs on 24th July, in long coarse grass, of the leaves of which it was composed, the ends of the grass being turned down and then up all round; the nest was 12 inches long and 8 broad. There was only one hole, but as I came suddenly on the bird, which was in the nest with its tail out of the hole, it made a clean dive through the other side, and had I been sharp enough I might have caught the bird in my hands, as it took a few seconds to get clear to the other side. The eggs are of the same shape as those of the Common Coucal, but much smaller and rather glossy. This nest was taken at Calcutta within 200 yards of Bishop's College, between it and the Botanical Gardens."

From Sikkim Mr. Gammie wrote in 1875:—"I have only found the nest of this Coucal up to 3500 feet, but have occasionally seen it during the breeding-season as high as 5000 feet, so that it pro-

bably breeds up to that elevation. It affects dense grassy jungle, and fixes its nest, two or three feet from the ground, in the middle of a large saccharum or other grass plant, by bending over a few of the stems to make a resting-place for it. It is composed of pieces of long dry grass and bamboo-leaves, put rather loosely together, and surrounded by the ends of the bent stems, which are twisted right over it and partly worked in with the dry material. In shape it is a roundish oval, measuring externally about 10 inches in height by 8 inches in width. The cavity is 4 to 5 inches in diameter, and is lined with a few green leaves. The entrance, which is at the side, is 3 inches in diameter.

"The usual number of eggs is three, and the breeding months May and June."

The eggs obtained by Mr. Gammie are broad ovals, obtuse at both ends. White with a faint gloss, and a good deal stained here and there with dirty brownish yellow. They measured 1.15 and 1.24 in length, and 0.96 and 0.99 in breadth.

Mr. J. Inglis informs us that in Cachar "this Coucal arrives here about the beginning of June and departs at the close of the rains; breeds from June till September. Like *C. intermedius* it makes its nest in a clump of tall grass or reeds; the nest resembles a round ball of grass with a hole in the side as an entrance. The eggs are generally six in number, round, and perfectly white."

Mr. Oates, referring to this bird, says:—"Breeds commonly in Lower Pegu throughout August. The nest is placed about two feet from the ground in rank grass, chiefly between paddy-fields on the bunds. It is shaped like an egg, about 10 inches high and 8 inches diameter. The entrance, 5 by 4, is placed midway between the top and bottom. It is composed of elephant-grass, and the surrounding grasses are bent down and incorporated with the structure. The egg-chamber and sides are neatly lined with thatch-grass. The walls are everywhere about 1 inch thick. In one nest there was a distinct vertical slit at the back, but I failed to notice it in others.

"The number of eggs is either two or three, and I have found both numbers well incubated. Egg-shell very chalky, but smooth to the touch and fairly glossy; colour white. Average of eight eggs, 1.17 by 1.01; and the extreme dimensions are 1.18 to 1.12 in length and 1.08 to .94 in breadth."

The eggs are moderately broad ovals, somewhat cylindrical, very obtuse at both ends. The shell is finer than in the preceding species, and seems to have a slight gloss at all times. They are pure white when laid, but acquire, as incubation proceeds, brownish-yellow stains and a greater general glossiness.

The eggs vary from 1.13 to 1.25 in length, and from 0.91 to 0.99 in breadth.

Taccocua leschenaulti* * (Less.). *The Southern Sirkeer.

Taccocua leschenaultii, Less., *Jerd. B. Ind.* i, p. 352; *Hume, Rough Draft N. & E.* no. 219.

Miss Cockburn, writing from the Nilghiris, says:—"This species, the Southern Sirkeer, is only found on the lower slopes of the Blue Mountains. I have obtained only one nest; this is large and consists of sticks put together much in the style of the Crow-Pheasant's nest. As only two white eggs were found in the nest alluded to, I am not aware how many this bird lays. The nest was discovered in the month of March."

Mr. G. Vidal writes from the S. Konkan:—"Rare. Found in hill-side jungle. I obtained a nest with a single fresh egg on the 8th April. The nest, a thick loose cup of sticks and leaves, was in a fork of a jambul (*Eugenia jambolana*) tree, about 12 feet from the ground. The egg-cavity, about six inches in diameter, and very slightly depressed, was profusely lined with green jambul leaves. The egg is a dull glossless white oval."

An egg kindly sent me by Miss Cockburn is of the usual *Taccocua* type. A broad very perfect oval in shape, the shell rather coarse and chalky in texture; the colour white, with a dirty pale yellowish or creamy tinge, confined apparently to an exterior film of excessive thinness, which has here and there, especially about the two ends, worn off so as to show a nearly white underlayer. The egg measures 1.4 by 1.1, and was taken on the 1st of March.

Taccocua sirkee* (Gray). *The Bengal Sirkeer.

Taccocua sirkee (Gray), *Jerd. B. Ind.* i, p. 353; *Hume, Rough Draft N. & E.* no. 220.

The Bengal Sirkeer lays from May to August, building a broad cup-shaped nest of twigs lined with green leaves, usually those of the tree on which it is built. It is said at times to build a dome-shaped nest, but I have never met with any of this form. It does not seem to have any choice as to the kind of tree, nor does it affect, like the Coucal, thorny species, but it selects, as a rule, some well-concealed and little-frequented locality. The nest is placed in some foliage-shrouded fork, sometimes only a few feet from the ground, and never, according to my experience, at any great height. In fact, I think it never chooses *large* trees, but always low, thick ones, or even bushes. Three I take to be the normal number of the eggs; at least I have never found more, while on two occasions I met with only two hard-set ones.

Mr. F. R. Blewitt says:—"The breeding-season is from June to August, but I cannot be sure that it does not lay at times

* Captain Shelley unites together the four species of Indian *Taccocua*, and I am inclined to agree with him. It is, however, more convenient to keep them distinct in this work.—Ed.

earlier. The nest is found in close-growing thickets in retired places. In structure it is very simple, a mere collection of twigs and leaves of kinds, in size about a foot in diameter, flat, having a small hollow only in the centre for the eggs. In this hollow leaves are spread over the surface, sometimes of neem, siris, and tamarind. The eggs in form and shape much resemble those of *Centrococyx*. They are white, with the surface covered with the soft chalk-like substance, but less in depth than what appears on the eggs of *Centrococyx*. I have found but three eggs in one nest, but whether this is the regular number I cannot tell, having only obtained in all three nests, respectively with one, two, and three eggs. They vary much in size from 1.3 to 1.5 inch in length, and from 1 to 1.1 inch in breadth. The Sirkeer is a shy bird and somewhat rare. It frequents wooded localities only, at least I have nowhere else met with it. In habits it resembles the Coucal."

Mr. Brooks, writing to me from Chunar, says:—"May 25th. Got a nest containing two fresh eggs, pure chalky-white, like the Coucal's, but smaller. The nest was in a small banian-tree about 15 feet high, and in a leafy fork 4 or 5 feet from the top. It was composed of sticks and twigs, cup-shaped inside, and lined with the leaves of the banian-tree. Both birds incubate; at the time the eggs were taken the female was sitting close to the nest, and the male so closely that the man had to climb up to it before it would leave. One of the eggs was pure white, slightly glossy; the other was a good deal discoloured. There were only two eggs in the nest, and yet they were partly incubated."

Major Bingham says:—"I found a finished nest of this bird on the canal-banks at Delhi on the 4th April. It was a firm deep cup placed high up in a babool-tree. I regret to say, when I visited it again it had been deserted."

Colonel Butler remarks:—"I found a nest of the Bengal Sirkeer at Deesa on the 6th of June, 1876, containing three well-incubated eggs. The nest was built of sticks, with a few green leaves as a lining, and in a low ber-tree in a wood about 10 feet from the ground. The hen bird sat very close, and with her tail erected perpendicularly. The nest was open at the top, and some of the twigs appeared to have been plucked when green. It was not in the least concealed; on the contrary it was in a very open place and easily discovered. The eggs were much in shape, size, and colour like those of *Athene brama*, but the shell differs in being of a very chalky nature."

The eggs much resemble those of *Centrococyx rufipennis*, but are smaller and more elongated. They are a dull glossless white; but these eggs too are, like the eggs of the Coucal, often covered with a pale yellowish-brown glaze, which is readily removed by washing or scraping, and leaves the pure white, somewhat chalky, shell unstained beneath. I am doubtful as to the nature of this glaze; eggs are often uniformly covered with it, while I have taken a whole nestful without a single trace of it.

The eggs vary in length from 1·25 to 1·45 inch, and in breadth from 1·02 to 1·1 inch; but the average of a dozen is 1·39 by 1·07 inch.*

* I add the following, which appeared in the 'Rough Draft,' under the name of *Taccocua affinis*, Blyth. Mr. Hume writes:—"I have never seen the nest of the Central-Indian Sirkeer. Mr. F. B. Blewitt, who found several in Saugor, describes it as precisely similar to that of *T. sirkee*."

"The eggs, which I received from him from Saugor, where this is the predominant race or species, appear to me to differ in no respect from those of *T. sirkee*. The birds themselves, many of which were also sent me, are smaller and darker-coloured, but, with nearly a dozen eggs of each lying before me, it seems to me impossible to separate the eggs. Like the eggs of *T. sirkee*, the eggs of this race generally become very much soiled and stained during incubation."

"In size the eggs I have (ten in number) vary from 1·34 to 1·55 inch, and in width from 1·03 to 1·1 inch; but the average of the ten is 1·4 by 1·06 inch, so that they are really a trifle larger than those of *T. sirkee*."—Ed.

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